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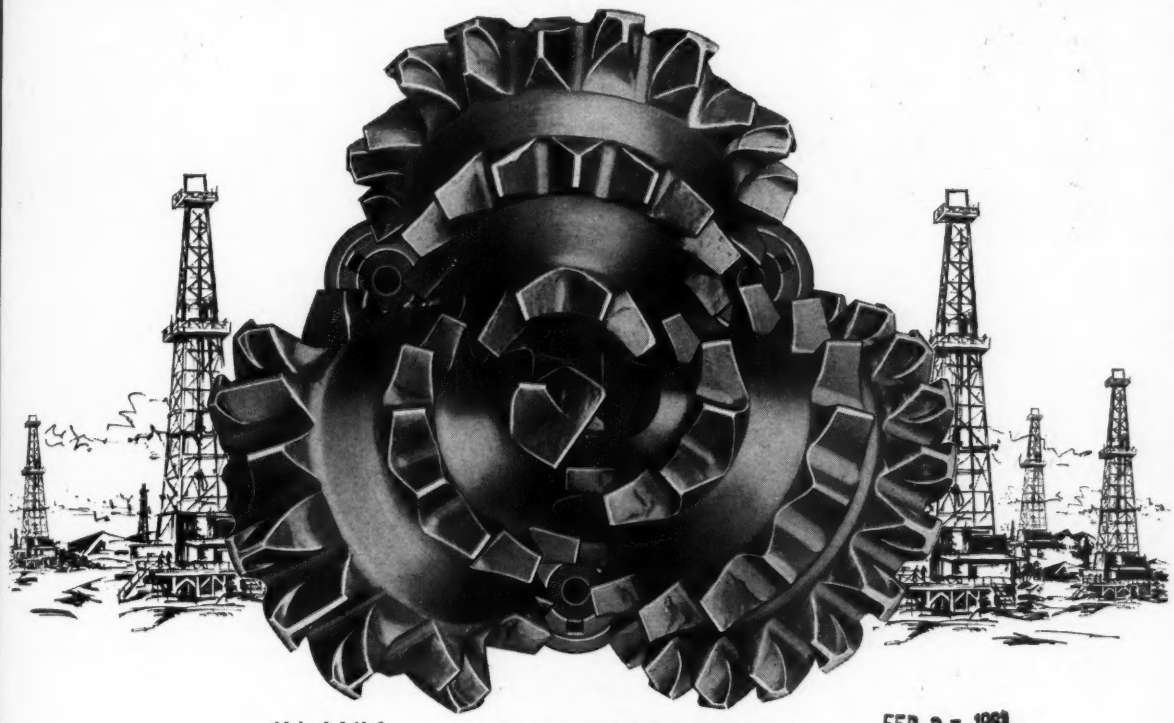

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The California Independent Producer Plays Important Role in Oil Industry

Editor's Note—A most important link in an efficient and well rounded oil industry is a strong and prosperous group of independent producers. The last three years have been tough on this group in California, but now it looks as though daylight is ahead. In the thought that it is timely, we present the following look at the events of the last three years, with a hopeful glance into the future.

Starting in early 1958, a series of events took place which jarred the independent producing portion of the California oil industry to its foundations.

At this time the business recession was under way, with fears that it would cut much deeper than it actually did. The main trouble for the producers, however, came from much more specific causes.

These causes were:

1. Drastic cuts in crude oil prices;
2. Difficulty experienced by many producers in finding a market, even at the lower prices;
3. Imports of oil with a lower price tag.
4. Increased importation of natural gas, cutting western markets for heavy crudes and fuels.

At the beginning of 1958 posted crude oil prices ranged from $2.63 for 14 gravity to $3.62 for 40 gravity. After cuts were made in 1958 and 1959 these prices were, respectively, $1.72 per barrel and $3.27. This was a cut of 91 cents, or over 30%, in heavy crudes and about 10% in light crudes. Reasons for these cuts were given as recession, over-supply of some crudes locally, and the world-wide condition of surplus. World movements of oil were facilitated by a surplus of available tankers which could be chartered at low rates.

When reductions in prices paid for crude oil in California became inevitable the relations between the producers and purchasers were of utmost importance. The philosophy of purchasers was not uniform. It varied from a sincere effort to take care of the producers' output to a policy of "the producer be damned." Of course, some producers had not sold continuously to one purchaser but had adopted a policy of expedience in selling here and there at the highest price temporarily obtainable.

At any rate, following the price cuts many producers not only suffered from the lower price but were partially or wholly cut off with no market for their oil. It followed that lots of crude was sold at fantastically low prices.

With the discovery of much new oil in foreign countries and with the availability of tankers at low rates, it was inevitable that imports of foreign crude in quantities harmful to the California producers would occur.

Import quotas for District 5 were originally established in January, 1958. These, however, were voluntary quotas and for a time were not too closely respected in some quarters and also did not look realistically at many factors in the California situation. Something over a year later these quotas became mandatory. The gradual improvement to the present time will be outlined later in this article. However, the point is that in 1958 and early 1959, imports really hurt the California producer.

The increased importation of natural gas from the mid-continent and elsewhere, and its effect on the local market for heavy fuels and crudes, was discussed in detail in the first November issue of California Oil World and will not be repeated here.

What were the results of all these events? In the first place, the producer found it much harder to find risk capital for the search for new oil. Obviously, with prices down and no long-term assurance that the producer's oil could be sold on a firm basis, banks could not be expected to loan money.

With lower income, and again often no assurance that the oil could be sold, there was less necessary development of the proven properties.

Secondary recovery methods, which while costly have proven their worth in recovering production not obtainable through ordinary operations, became almost solely an activity of the major companies.

And finally, and most tragic, a number of California producing companies sold out to Eastern or Mid-Continent interests or combined with other local producers. In most cases it is assumed that these sales were forced by the conditions which we have discussed. Surely this was a bad thing for the California oil industry.

As 1961 gets well started on its way there are many signs that things are picking up. In fact, these signs have been becoming plainer for a number of months.

First, as to crude prices: In September, 1960, there was a 10-cent increase in heavy crudes. This isn't much, but it is a start.

Richard R. Von Hagen, president of the Oil Producers Agency, has been publicly arguing in favor of a substantial price increase. He points out that even an increase of 35 cents per barrel for lighter crudes and 80 cents a barrel for the heavier crudes would merely restore California crude prices to the 1957 level. "Even then," he states, "the California producers' economic health would not be as good as it was in 1957 because of increases in all costs, including wages, that have occurred in the meantime."

Backing up his argument, it is true that West Coast inventories of oil in storage have decreased from over 144,000,000 barrels at the end of 1957 to about 118,000,000 barrels at the end of 1960. During this time District 5 demand has increased 12% and California production has decreased 10%.

Historically the California producer has responded to increased prices by accomplishing increases in production.

There are world situations which should increase the probability of California crude price increases, eventually if not immediately.

Authorities agree that the overall tanker situation is tightening up and may increase the cost of long-distance transportation.

Foreign governments are constantly striving to increase the percentage of total revenue paid to them by the companies which are developing their oil resources. This will tend to increase the prices of foreign crude.

The demand for energy in Europe and the rest of the Free World is jumping so rapidly that much of the temporary surplus will be absorbed.

For example, statistics show that the Free World demand for petroleum outside the United States in 1960 increased 11% over 1959 while demand in the United States increased 2%. Also, the Free World foreign demand is now almost equal to United States consumption, which continues a trend most apparent in recent years.

Economists have estimated that it costs from $3.50 to $4.50 per barrel to find new oil in the United States. And yet the average price is somewhere around $3. It would seem that the average producer is losing money every time he finds a new oil field or zone. This can be explained by the fact that millions of dollars are spent in exploration with absolutely no return. The big operator writes this off and the small operator goes out of business.

This is a powerful argument for higher crude prices. It also confirms the oil industry's oft-stated position that the present depletion allowance is an absolute necessity if the industry is to have any incentive to continue searching for new oil supplies, which, while not immediately needed, are essential to the safety of our country.

It also reminds us that only one wildcat out of nine finds any oil.

Another favorable development is that the California producer now has a steady market for his oil, no distress production being apparent. In fact, the statistics on stocks quoted above indicate that the producer could sell more oil (perhaps up to 200,000 barrels a day) if he could produce it.

The matter of long-term contracts between producer and purchaser is hard to comment on constructively because of certain governmental restrictions on this type of contract now in force—consent decisions issued some time ago in anti-trust cases. Suffice it to say that when as and if new long-term contracts can be written it will be a great boon to the California producer. The reason for this is, of course, that his oil and gas are his only sources of revenue and a long contract assures that revenue can be counted on for desirable exploration and developmental expenditures.

For the integrated companies this is not that important. Neither are crude prices, because their revenue is determined so largely by the prices at which they can sell their finished products.

The import problem as it affects the California producer has progressively improved until the situation is the most favorable it has been since the first voluntary quotas were established in District 5 at the beginning of 1958. In the early days of the program many producers felt that the control authorities were reluctant to get down to cases and make a realistic appraisal of the situation. As time wore on and many discussions were held they seemed to come up with better numbers. 1960 quotas were much tighter than 1958 and 1959, and 1961 is still better from the standpoint of the local producer.

Furthermore, enforcement of the quotas has been good. Importers receive a quota for a six-month period. They then get a license for the importation of this amount of oil. Customs people keep track of imports against quota, and when the quota has been used up, no further shipments may be brought in until the succeeding six-month period begins.

Since Stark Fox, executive vice president of the Oil Producers Agecy, in a letter to members, states that the import quota for the first six months of 1961 appears reasonable, barring a serious recession, it might be interesting to take a look at the figures and how they are arrived at.

The U. S. Bureau of Mines estimates the District 5 demand for the first half of 1961 at 1,388,000 barrels a day. This is made up of domestic demand 1,285,000 b/d, foreign demand for District 5 oil 84,000 b/d and shipments from District 5 to other Districts 19,000 b/d.

From this demand is deducted estimated supply totaling 1,096,000 b/d. This is made up of crude production 836,000 b/d, natural gas liquids 80,000 b/d, Four Corners Pipeline 80,000 b/d and Product Receipts 100,000 b/d.

After deducting 12,000 b/d from demand for the "in bond" residual fuel, the Bureau's deficit in supply is 280,000 b/d.

From this 280,000 barrels the Bureau deducts product quotas of 11,000 b/d and Canadian exempt imports of 40,000 b/d. This leaves 229,000 b/d to be allocated among importing companies.

This quota is 34,000 b/d less than the quota for the last half of 1960.

Later, as a result of representations by the Oil Producers Agency and others, demand figures were reduced another 11,500 b/d, considered excessive shipments of distress crude to other areas from District 5.

This brings the import quota for the first half of 1961 to 217,000 b/d.

Representing the views of the importing major companies is the following partial quote from vice president Max Jayne of Standard Oil Company of California which appeared in the December 1960 issue of a company publication, "The Standard Oiler." Speaking of the import quotas, he said:

"Our company is convinced that the relationship between imports and domestic production must be consistent with the best over-all interests of the United States. In general we believe the present relationship answers this requirement.

"Among the shortcomings of the existing quota system is that it tends to reduce incentive for foreign exploration and development.

"What we need are controls which recognize both the importance of maintaining a healthy domestic producing industry and the necessity of protecting our foreign supplies and foreign investments.

"American industry depends upon the investments of its stockholders, who are entitled to be adequately rewarded for the use of their money.

"Inequitable restrictions hinder the ability of international oil companies to give their stockholders a fair return. Inadequate recognition is being given to historical importers . . . which generally are the ones that have taken the risks overseas."

Finally among favorable contributions to the outlook for the California oil producer is the continued dramatic growth of the West.

Growth in population, in industrial development, in housing construction, in tourist travel, in family income and spending, far surpasses the average for the entire country. There are certainly no signs that this great growth will slow down. These figures are so familiar that they need no spelling out here.

In passing, it might be noted that there is a favorable factor enjoyed by California producers in contrast to Mid-Continent producers. In California there is practically no shut-in production and producers have a market for all the oil they can produce.

Mid-Continent conditions are much less favorable. At present, new discoveries there are rated at the highest possible potential. Thus the producer can get as many barrels of allowable production as possible under the limited number of days' production he is permitted. As this is written, Texas is limited to eight days per month. The amount per day is based on his supposed potential. While it is unlikely that wide-open production could be maintained for any length of time at the estimated potential, all will agree that a great percentage of possible producing capacity is not now being recovered. It will be a long time before much improvement may be expected from this standpoint in the Mid-Continent.

Looking at the over-all situation, it seems to California Oil World that optimism over the future of the California independent oil producer is well justified. The corner has certainly been turned and conditions should continue to improve, possibly at an accelerated rate.

We are confident that the independent producer will continue to play a solid and important part in our industry as far down the road as we can see.

Richfield and MHD Research Join to Develop New Petrochemical Process

MHD Research, Inc., and Richfield Oil Corporation have joined forces to develop a new, ultrahigh temperature petrochemical process. The work, which is based upon discoveries made by MHD personnel, will be performed at MHD's Newport Beach laboratory.

The process involves the gas-stabilized arc techniques developed for space age needs and which MHD has been actively applying to commercial areas. It is possible to achieve controlled, extremely high enthalpy conditions in hydrocarbon systems by means of this device. It is this ability which has attracted Richfield in its search for new and revolutionary approaches to chemical processing.

Richfield and MHD feel that the major development project now under way will advance plasma chemical processing far beyond its present state and that the information gained will serve as a basis for extending the general techniques to other petrochemical systems in Richfield's area of interest.

Welex Moves To New Location

Welex sales, operations and administrative departments have moved from 1400 East Berry Street, Fort Worth, to 1728 Old Spanish Trail, Houston.

The move was part of the wireline service organization's transfer of headquarters to Houston.

Halliburton vice president Turner Armstrong is general manager of the new Welex Division and is headquartered in Houston. Other Fort Worth sales, operations and administrative executives transferred to Houston include sales manager W. E. White, operations manager H. B. Lee, assistant manager of administration R. E. Lowe and advertising and sales promotion manager Jack Hickey.

Remaining in Fort Worth are former Welex president Ray O. Shaffer, sales engineer Ray Evans, manufacturing and administrative manager T. W. Painter and former materials manager G. C. Jefferis. Painter is new general manager and Jefferis is production manager of Freight Master, a division of Halliburton Company. Freight Master, which manufactures railroad coupling units, formerly was a division of Welex, Inc. Freight Master production is to continue in Fort Worth at the former Welex location on East Berry Street.

Dresser Industries And Reed Roller Bit Co. Study Merger Possibilities

The boards of directors of Dresser Industries, Inc., and Reed Roller Bit Co. have agreed in principle on a plan under the terms of which Dresser will acquire the business and assets of Reed, as well as assume its liabilities, upon the issuance of 477,050 shares of Dresser common stock. This is the equivalent of issuing 7 shares of Dresser stock for each 10 shares of Reed presently outstanding.

Attorneys for the companies are preparing a formal agreement covering the transaction which is contingent upon approval of the definitive agreement; upon favorable opinion of legal counsel for both companies; and approval by the Reed shareholders.

WEST COAST OILMEN GUESTS OF UNITED STATES NAVY AT PEARL HARBOR, headquarters of Commander in Chief of the Pacific Fleet—Shown above is E. "Pick" McIver, president of Petroleum Production Pioneers, conversing with Admiral John H. Sides (second from right), CINCPACFLT, while Vice Admiral John S. Thach, Commander Antisubmarine Defense Force, U. S. Pacific Fleet, and O. M. "Curly" Working listen in. These well known West Coast oilmen were invited to Headquarters of CINCPAC at Pearl Harbor, Hawaii, along with several other persons for orientation and briefing regarding Navy's problems and preparedness in the Pacific. Working and McIver are Directors of Navy League.

Republic Has Good 1960; Looks Forward to 1961

Record high gross income of $38,297,000 for the year ended Oct. 31, 1960, was reported Feb. 1 by The Republic Supply Company of California, representing an increase of more than 10% over the $34,568,000 recorded in 1959.

President Thomas P. Pike said net earnings after provision for taxes were $603,000, equal to $1.32 per share on the 456,896 shares of common stock outstanding, after giving effect to a 10% stock dividend paid January, 1960. This compares with $1.74 per share earned by the company a year ago based on the same number of shares.

Pike stated that a long-range expansion program begun in mid-1959 brought increased sales this year despite last year's general economic slowdown. He explained that the program included establishment of a metals division, diversification into the tube supply business, expansion of the company's waterworks program and construction of a new branch in Sacramento.

He added that improvement in general business conditions during 1961 should contribute to favorable sales and earnings next year.

During the past year, in addition to a 10% stock dividend, Republic also paid $1.00 per share in cash dividends, making 1960 the 38th consecutive year in which the company has paid cash dividends.

Texaco Reports Record Earnings

Augustus C. Long, chairman of the board of Texaco Inc., has announced estimated net income for 1960 amounted to $391,750,000, or $6.34 a share, compared with $354,346,323, or $5.85 a share, in 1959.

Based on these preliminary figures, 1960 earnings were 10.6 per cent higher than in the record year of 1959, Mr. Long disclosed. The year's results reflect an improvement in earnings from operations of 14 per cent, as well as an increase in dividends from affiliates of almost 4 per cent, Texaco's chief executive officer reported.

Capital and exploratory expenditures were approximately $520,000,000, up slightly over 1959. Mr. Long indicated that similar expenditures in 1961 will be at approximately the same high level.

So. Calif. Edison Announces Plans for Huge Construction

A construction budget of $13[0] million was announced by Southern California Edison Company for 196[1] —the sixth consecutive year tha[t] the power company's plant outlay[s] have exceeded $100 million.

During the past ten years Edison has spent more than $1 billion i[n] additions and improvements to it[s] electrical system serving Centra[l] and Southern California, accordin[g] to Harold Quinton, Edison chair[-] man.

The king-sized boost to the South[-] land's economy in 1961 will take th[e] form of building huge new genera[t]ing plants, electrical substations, o[f]fices and about 950 line miles o[f] power circuits.

Edison expects to install abou[t] 62,000 new electric meters in 196[1] in the 10 counties it serves—equiv[a]lent to the addition of a new city o[f] its system of about 200,000 popu[-]lation, Quinton said.

The total population of Edison's service area is now 4.8 million and Quinton looks for this figure t[o] reach 10 million by 1985.

"By then," he said, "we expect t[o] have reached a goal considered al[-]most incredible a decade ago — a peak electrical demand on our sy[s]tem of 10 million kilowatts."

Edison has more than a millio[n] kilowatts of additional generating capacity either under construction now or authorized for the near fu[-]ture, Quinton announced.

Among the current projects, h[e] said, are the world's first computer[-] automated generating units. These are being built at the Huntington Beach Steam Station. The computer controls will utilize an electroni[c] brain that can remember as many as 2,000 chores to be done in operating the huge equipment.

With mid-year completion of Uni[t] 4 at Huntington Beach, Edison's total investment at that one installa[-]tion will exceed $110 million, he pointed out.

At Alamitos Steam Station, near Long Beach, work is progressing on two units that will nearly triple the generating capacity of the present plant. Quinton said the new units, each rated at 310,000 kilowatts, will cost about $78 million and are scheduled for completion next year.

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HIGHER SAMSON POSTS . . increase operating efficiency through improved geometric design . . permit more efficient well counter-balancing. A maximum 1.06 torque factor has been attained by this design for all units.

MORE FLEXIBILITY . . 18 different units make it possible to apply the right unit to any well load for lower initial and operating costs . . a wide variety of stroke lengths is available for all pumping requirements . . any type of prime mover can be used to take advantage of gas or electricity, whichever is lower in cost.

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NEW WRIST PIN AND PITMAN CONNECTION . . Permits faster field assembly and speeds up changing stroke length. Pitman attaches to wrist pin bearing housing with through bolts. Tightening the bolts brings the parts together accurately and simply.

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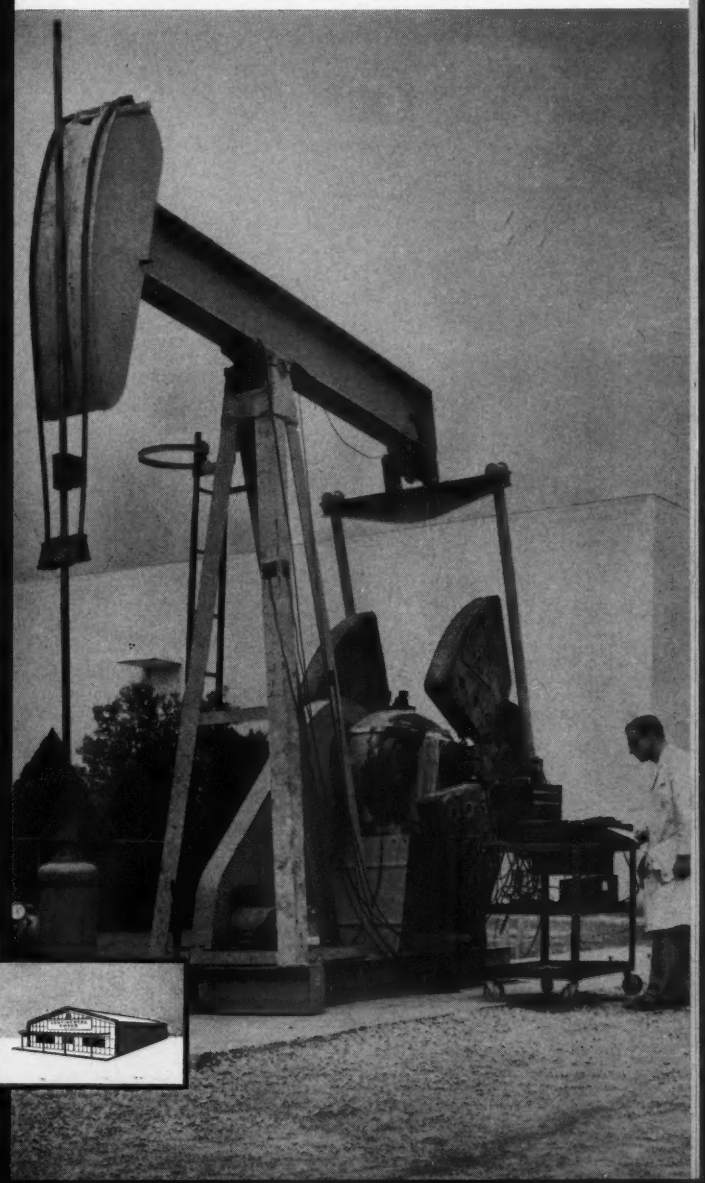
QD SHEAVES, STANDARD . . available anywhere, these sheaves are lower in price than special sheaves.

STRUCTURAL CAPACITIES . . from 5,300 lbs. to 29,000 lbs. in 18 sizes. A unit pumper size for every well.



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Petroleum LORE and LINGO

By RICHARD SNEDDON

Ultimate Yield

There has probably never been a time in the history of the California petroleum industry when the stimulation of production by any satisfactory means was quite so urgent as it is at this moment. For more than a decade discoveries have failed to keep pace with expanding requirement and operators have become increasingly conscious of the need to bolster the ultimate yield of oil through the utilization of appropriate remedial and secondary recovery techniques. Please note that the word "ultimate" is used here studiously, for a mere boosting of the current rate of production without regard to the end effect is not the sort of stimulation that will solve the industry problem. The bringing about of a temporarily increased yield with an unnecessarily great sacrifice of reservoir energy is inefficient and hence inadvisable. The true objective of any rational effort in this direction must be not merely to produce the wells faster but to increase the eventual lifetime recovery from the subsurface reservoir.

Exploration Verboten

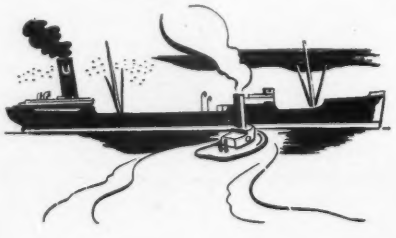
Failure of exploratory surveys to fatten the State's reserves sufficiently is due largely to the fact that in the first century of probing the searchers did so well that, with the possible exception of offshore deposits, what is left is extremely difficult to find. The "easy" stuff has already been located. In addition, of course, higher land values, together with climbing labor and equipment costs, have sent development expense skyrocketing beyond the means of any ordinary mortal and, indeed, beyond the means of most organized groups of mortals. If the politicos now start paring the depletion allowance, they will, to all intents and purposes, at the same time be posting the verboten sign on any further advance along the exploration route.

Secondary Efforts

For a number of years the entire subject of secondary recovery has been studied intensely by reservoir physicists and engineers. Much has already been accomplished in a practical way but laboratory and field experimentation continues, and some ingenious methods of augmenting recovery are already in effect, while some revolutionary new ones are in prospect. The total effort is predicated on the assumption, easily demonstrable, that by the best known methods now available, only a part of the oil in the reservoir is brought to the surface. The rest of it remains adhering to sand granules or trapped in interstitial and capillary channels. As those who have read prior discussions in this area already know, granules are just small grains or grainlike particles; interstitial spaces are those between grains; and capillary channels take their name from Latin capillus, "a hair." They are very small-bore passageways through the oil-bearing rocks.

Remedial Measures

Estimates of the proportion of oil remaining in the sand after the wells are depleted range from 30% to 70%. It varies, of course, according to the viscosity of the fluid, the character of the permeable medium in which it is contained, and a number of other influencing factors that need not be discussed at this point. Stimulatory techniques so far tried have been mostly used on depleted sands, so-called; from unusually tight sands that give up their treasures reluctantly; or from normal formations, if there is such a thing,



that contain exceptionally viscous crudes. Several types of drive, for example, liquid, gas, and air, have been tried with varying degrees of success. Solvents, particularly lighter petroleums, have been effective in reducing the viscosity of heavy crudes and to a marked extent increasing their total yield. Acidization has been utilized to remove lime and other soluble rock constituents, thus opening the pores at the well face and enlarging the interstitial channels, under favorable circumstances for some distance back into the formation.

Affecting Factors

Combinations of the various methods mentioned have also been designed, and a number of chemicals have been employed to perform certain functions definitely related to the lifetime behavior of the wells in which they are used. In recent times there has been much concentration on thermal systems which employ hot water, hot oil, hot gas, and even actual fire to loosen the grip of the more obdurate hydrocarbons. Each method, thermal or otherwise, is operative within its own set of optimum conditions, and is subject to its own private set of limitations. Hydrocarbons are insoluble in water, or nearly so. Thus while their viscosity may be reduced by contact with hot water, and they may be carried to the well face by the passing tide, the process is by no means absolute. Water and oil, when agitated in the presence of infinitesimal quantities of other substances, can and do emulsify, whether the resulting phase is water-in-oil or oil-in-water, viscosities, surface tensions, and other pertinent factors in the secondary recovery process are markedly changed.

Other Methods

I remember one sizable project that was stymied for a long period because of the presence of algae and

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Advantages of Type H Saver:

Hydraulically operated by field-proved piston principle . . no trouble-causing rubber bladders or complicated mechanism.

Large rubber and generous bushings give a smooth, constant seal. Rubber can be used until almost completely consumed.

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Non-sparking, durable split bushings . . top and bottom interchangeable.

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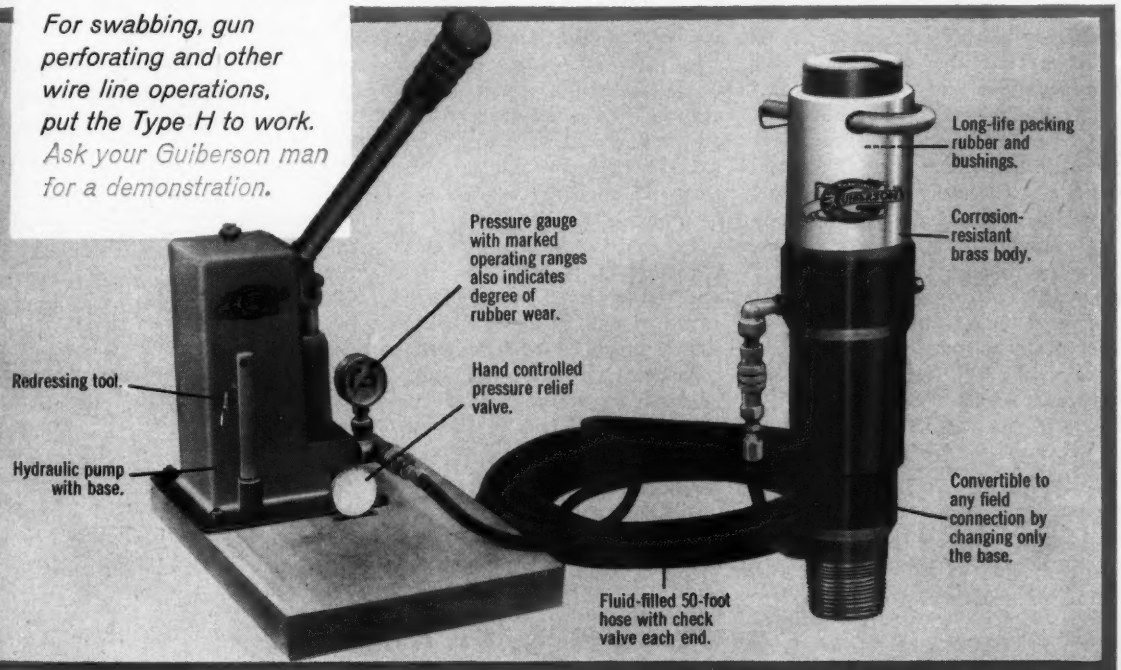
Remotely controlled . . allows at least 50′ leeway from saver to pump.

For swabbing, gun perforating and other wire line operations, put the Type H to work. Ask your Guiberson man for a demonstration.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other organic matter in the injection water. This type of interference may be in the form of anaerobic bacterial clusters. These little rascals multiply prodigiously and if their mission is mischievous rather than helpful they can certainly gum up the works. Being anaerobic means that they can live in an atmosphere that excludes oxygen (or air) and some of them, as has already been explained, make their homes and have children **ad infinitum** in crude oil. Secondary recovery by means of ultrasonic vibration (that is, the short, fast shakes that are inaudible to the human ear), and even by application of nuclear energy, are also under study. Of these more later.

Water Flooding

The first method employed and consequently the one about which most is known is water-flooding. It has already been responsible for the recovery of much oil that had long been given up as lost. In large part the success of this method is due to the facts that the viscosities and densities of oil and water are relatively close together and they consequently tend to stay in admixture. Separation and channeling off of one component in any direction is, of course, to be avoided. The water is usually injected in a series of peripheral or round-the-edge wells, and thence moves through the oil sands towards the inner producing wells. Other patterns may be employed to accommodate to differing subsurface conditions. Recovery may be as high as 40% of the original deposition in the reservoir but this is by no means guaranteed.

Preliminary Investigation

All the elements must be right or the process can result in a sizable expenditure of time and money with little return. Like many other phases of petroleum production, this and alternative forms of secondary recovery are being operated on a unitization basis by a combination of the interested parties in the various fields. In most of them, for any reasonable measure of success, it is essential that the reservoir be homogeneous in structure and possess a continuity of permeability. Even with these favorable conditions, however, the viscosity and gravity of the oil, the character of available water, or the presence of harmful extraneous influences may upset the entire applecart. It is obvious, then, that prior to the actual launching of a water-flooding program, or, indeed, any other kind of secondary recovery program, it is first necessary to carry out extensive core analyses, to determine bottom-hole and general reservoir characteristics, and in all respects to be preinformed in order to assure a rationalistic plan.

Surface Tension

One of the physical phenomena that is most assertive in this business of secondary production is surface tension. This is the property, inherent in liquids to a greater or lesser degree, that makes them tend to form in round drops. It is the force that makes the molecules of a compound huddle together and it is one of the forces that must be modified before secondary recovery can be most effective. I haven't seen any explanation of this property but I would incline to the belief that since even the smoothest surface, when viewed through a sufficiently powerful microscope, is seen to be quite irregular and uneven, it may be assumed that the interstices of an oil sand are infinitely more irregular. In their involuntary effort to wrap themselves up in spherical form, thus, the layers of oil molecules that are in direct contact with the sand surfaces reach into pores and depressions, cover jagged projections, and in general become so firmly attached by a myriad of microscopic tendrils and their own contractive striving that they are by no means easily dislodged.

Weakening the Grip

Surface tension, however, can be weakened in a number of ways. Heat will do it. Changes can be induced by solvents, and substances known as surfactants are now expressly designed to lower the surface tension of both water and oil, so as to improve injection rates and oil recovery. At first the innovation was a failure because surfactants were not used in the proper concentration and the ones that were used were themselves trapped on the rock surfaces by a process called adsorption to distinguish it from absorption, in which permeation of the fluid is all the way through the porous system. New type surfactants with lower absorption tendencies, and in higher concentration, promise better results in current and future waterfloods.

Others Are Interested

It is to be noted that the complexities of secondary recovery are not the sole concern of oil producers or companies. Manufacturers of drilling fluids, mud additives and downhole chemicals, and other persons or organizations indirectly interested in production, have been working diligently towards the development of a synergistic combination of processes and products that will resolve all the foreseeable difficulties and bring about a sort of secondary recovery millenium. Synergistic is an interesting word that means "working together." It is from the Greek syn, "together," and ergos, "work," and it has an added connotation that should be understood. To scientists it means, in full, working together in such a way that the total effect is greater than the sum of the individual effects of involved actions and reactions. That sounds a trifle confused, but stay with it for a minute and you'll get the idea.

Physicists and Engineers

One might wonder how mud manufacturers and their kin become wound up in this kind of offbeat enterprise. The fact is, however, that the nature of their normal day-to-day business brings them into close contact with the vagaries of production procedures. The study of surfactants, drilling fluids, and other components, each designed for a particular downhole need, excites interest in the entire gamut of subsurface problems. But without intimate experience even the most competent logician would find it difficult to rationalize all the factors that govern the flow of oil, gas, and water in porous media. That requires a knowledge of some pretty abstruse physics, and some highly advanced mathematics. Hence we find that in their anxiety to be fully informed, the manufacturers of production fluids and chemicals either have on their staffs or have available as consultants qualified reservoir physicists and engineers.

Use of Carbon Dioxide

Returning now to a brief description of the different secondary recovery techniques, a comparatively recent development is a system that employs carbonated water. The water gives up its carbon dioxide in the formation. The gas is quite soluble in crude oil, which it lightens and

makes less viscous, and so easier to move. Provision has to be made for the later separation of oil and gas, and experts seem to agree that the gas itself could be used as a displacement medium but would offer no advantage over petroleum gases. They are both soluble to about the same extent in crude oil but carbon dioxide is also soluble in water and that would mean a considerable loss of gas or a considerable expense in recovering it. The preferable method is to pump a slug of gas down the injection well or wells and then follow it with a water drive. Carbon dioxide when mixed with water forms a mild acid. This is good because the condition is conducive to better injectivity in some formations. However, in view of its solubility in both oil and water, and the eventual necessity of separating it from these, the economic feasibility of its use is doubtful. In most instances that call for gas injection, L.P.G. would probably be the most satisfactory answer.

Raising Water Level

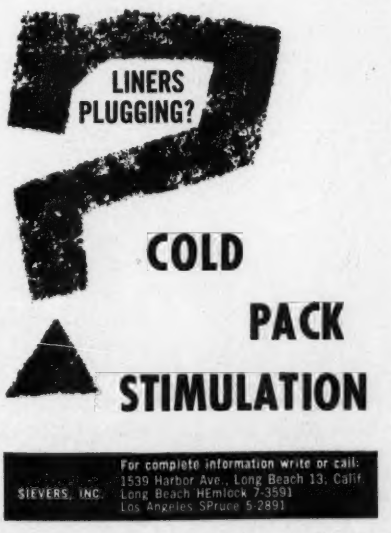
Some years ago a unique method was employed in the old Kern River oilfield to produce a large number of wells that had been considered depleted beyond the point of profitable return. The system here consisted merely of pumping water in large quantity down into the producing formation. Turbine pumps did an excellent job of gradually raising the water table in the reservoir and floating the oil up to within reach of the well pumps. Just how much oil was recovered in the long run and whether any of the wells are still pumping I can't say at the minute, but I do know that for some time this was a profitable enterprise.

Accumulation of Data

The type of secondary recovery used in any particular field is dependent on many subsurface factors, and usually a vast quantity of pertinent data is accumulated during the primary depletion period. On the basis of this, the method most likely to succeed is adopted. It is the opinion of the better informed engineers that the start of planning for secondary recovery should coincide with the beginning of production. The two phases really constitute a continuous process, the closing portion of which is determined by preliminary behavior. At one time, when the industry was suffering the consequences of over-production, a western company pumped oil, which it was obliged to produce, into a field that it held in fee, and was able, therefore, to shut in. This venture was not only successful from a conservation viewpoint but it provided valuable experience that no doubt helped to shape the practice of using light oils for secondary recovery purposes. With a closed reservoir in which conditions are known, the injection pattern can be readily defined and under the proper circumstances recovery can be of rewarding magnitude.

Underground Gas Storage

The same may be said of gas storage. There is no question that the current practice of pumping gas into depleted subsurface reservoirs in summer so that it will be available when peak demand comes in winter has developed data of inestimable value in secondary recovery. Gas injection is one of the older methods of augmenting reservoir yield. It is used extensively to repressure light-oil wells; in other words, to replace formation gas that has been dissipated in the first stages of production, and thus to extend the flowing period. It is not satisfactory for a horizontal drive such as may be conducted with water. The differential between the gravity and viscosity of the gas and the gravity and viscosity of the formation fluids is so great that fingering, bypassing and channeling become serious problems. There are many variations in the manner of using gas, either by itself or in combination with other injection fluids such as water, light oil, and solvents other than petroleum, to sweep through primarily depleted sands and gather in the petroleum bonus. Continuous cycling of gas in condensate reservoirs has been responsible for the recovery of large quantities of liquid components that would otherwise have remained in the grip of the oil-bearing sands.



Thermal Methods

Especially interesting are thermal methods of recovery, and among them is the only process that can, theoretically at least, strip the sands of their last vestige of oil—direct fire. In this the oil adhering to the sand grains is actually set afire in an atmosphere of oxygen (air), pumped down the injection wells under pressure. As the wave of flame advances from the point of ignition out through the reservoir, the hot gases preheat and distill the oil immediately ahead. The vapors are subsequently condensed as they migrate to the producing well. That portion of the oil which is not vaporized is consumed and, of course, the fire may be shut off at any time by simply shutting off the oxygen or air supply. Other species of thermal attack make use of hot fluids, steam, electric heaters, and gas-fired burners. They are all effective in various degrees when applied in suitable situations.

Bacterial Action

The role of thigmotactic bacteria in moving oil has already been enlarged upon, so also has that of the oil digesting breeds that change the character of the formation oil, reducing its gravity and viscosity and affecting most of its properties. Some effort has been made to control the efforts of these little organisms but so far as I know the process hasn't been successful. In any case, it is certainly not widely practised. Ultrasonic vibration can move the residual oil but the manner of its application is still a sort of dream child. Also in the ethereal stage is the possible use of nuclear energy, perhaps in the form of a bomb, explosion of which would literally cook the oil, breaking it down into goodness knows what, and maybe by irradiation investing the end products with a rich charge of Vitamin B-1.

LOS ANGELES CHAPTER ELECTS OFFICERS — Incoming and retiring officers at the Annual Business Meeting of the Los Angeles Chapter of Nomads, January 11, 1961. From left to right (front row) P. M. Bowen of Martin-Decker Corp. (Treasurer 1960); C. C. Sutton of Oil Well Mfg. Co. (Assistant Secretary 1960); Charles M. King of Baker Oil Tools, Inc. (President 1961); Louis Q. Webber of Martin-Decker Corp. (Treasurer 1961); Lee J. Laird of Ladish Pacific Div. (Sergeant-at Arms 1961); John Cochran of driltrol (Assistant Treasurer 1961); (back row) Robert P. Gaylord of Wagner-Morehouse, Inc. (Senior Regent 1960); B. Bronzan of McCullough Tool Co. (Deputy Sergeant-at-Arms 1960); Willard F. Goertz of Monarch Engineering Co. (Deputy Sergeant-at-Arms 1961); Earl M. Daniels of Hydril Company (Regent 1960); Tom R. Ashe of Globe Oil Tools Co. (Regent 1961); Henry W. Pullman of Baker Oil Tools, Inc. (Senior Regent 1961).

membership of about 2,300, embracing representation from the oil industry and the equipment and supply business allied with petroleum.

Long Beach D&D Club Tours Baker Oil Tools, Inc.

Desk and Derrick Clubs of Long Beach and Los Angeles toured Baker Oil Tools, Inc., on February 7th.

"This field trip, designed to acquaint local petroleum employed women with the manufacture of specialized tools, is in keeping with the educational aims of our national organization," Mrs. Margaret Ericson, Long Beach club president, said.

Planned and executed by E. D. Flecky, assistant personnel manager of Baker Oil Tools, the tour included a buffet dinner, presentation of the film, "Success Story," and an informative talk by R. A. Kent, senior staff engineer.

Afterward there was a question and answer period.

Rosie MacBride, field trip chairman, instigated the event.

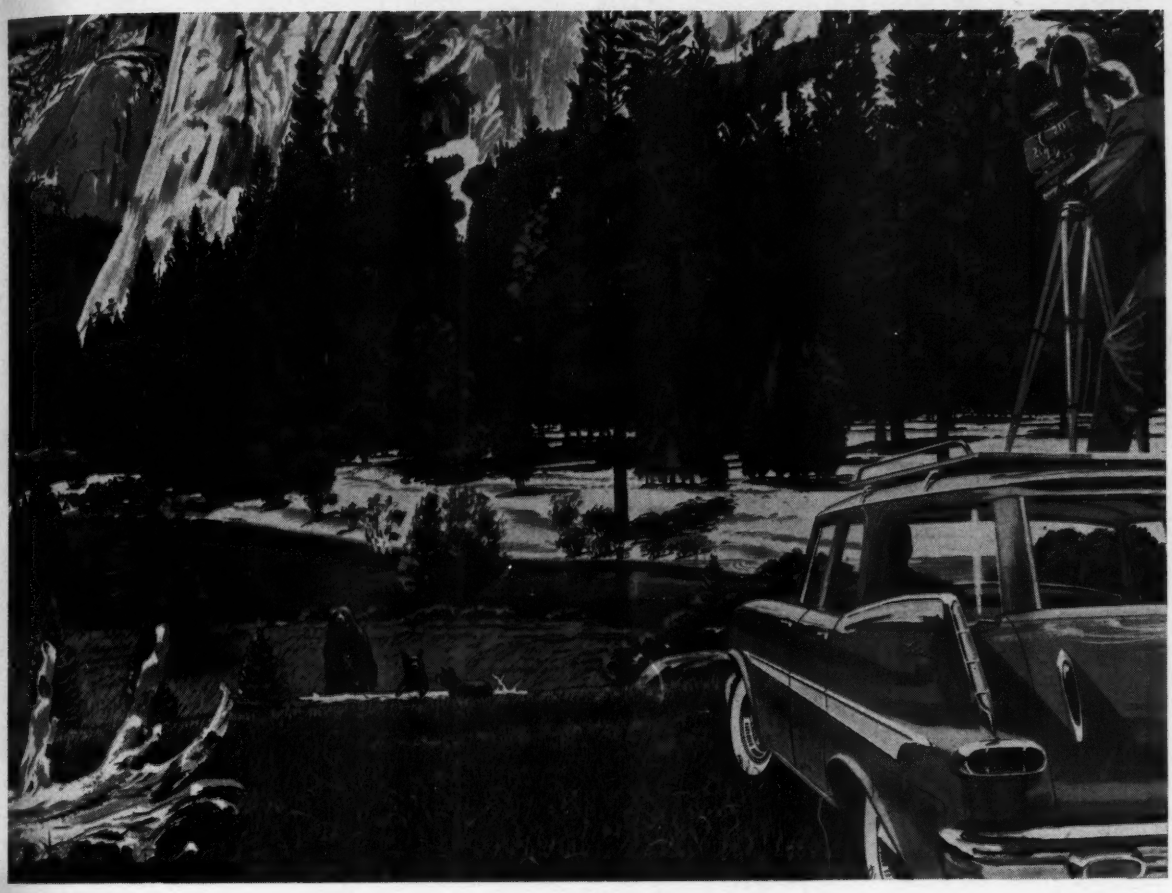
Petroleum Production Pioneers Elect Officers For 1961

D. G. Kingman, manager, joint venture operations, for Mobil Oil Co., was elected president of Petroleum Production Pioneers at the annual board meeting held at the Petroleum Club January 30. Kingman succeeds E. "Pick" McIver, formerly with Shell, now petroleum consultant. Basil Kantzer, vice president, Union Oil Co. of Calif., was elected vice president. Sam Grinsfelder, vice president, exploration, for Union Oil Co. of Calif., retired, was elected honorary president, and E. "Pick" McIver, honorary vice president.

Other officers elected were: Floyd Vaughn, Halliburton Co., as treasurer; Paul Andrews, Signal Oil & Gas, re-elected historian; Hugh Gribbin, manager, Drilling Fluid Div. of Macco Corp., as sergeant-at-arms; and Elmer Olsen, re-elected secretary.

Petroleum Production Pioneers has grown from a nucleus of only a few members in 1944 to a present

DESK & DERRICK CLUBS CARRY ON EDUCATIONAL PROGRAM—Participants in this field trip at Baker Oil Tools, Inc., are, left to right: Rusty Holmes, Los Angeles Desk and Derrick member; Sarah Beth Smith, Long Beach Desk and Derrick club; Vera Williams, Los Angeles club; Rosie MacBride, Long Beach chapter; and R. A. Kent, senior staff engineer. All are employees of Baker Oil Tools, Inc.



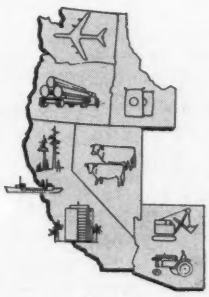
This Movie Is Made for the Animals

Although nature's creatures will never see this film, it's made for *them*. One of a series produced by Richfield Oil Corporation, its purpose is to create greater public interest in conserving *all* our natural resources: wild life, forests, grasslands, water, oil and minerals.

Last year alone, over 14-million persons viewed these award-winning Richfield films. Among the most popular is "Let's Keep America Beautiful," showing how, through education, our scenic and recreational areas can be left litter-free.

Other films cover subjects ranging from Western wild flowers to the natural resources of our Western States, including Alaska.

Produced in cooperation with the United States Bureau of Mines, the state natural resources films are distributed in the West by Richfield and nationally by the Bureau. These and other films are made available to thousands of organizations each year as a public service. Richfield is proud to play a part in the conservation of America's greatest material wealth . . . her natural resources.



RICHFIELD
OIL CORPORATION
LOS ANGELES, CALIFORNIA

THE FAR WEST—land of dynamic industrial and population growth—where Richfield vision and research produce a wide variety of years-ahead petroleum products.

Summary of District V Oil Industry Conditions December 1960 Preliminary

By OIL PRODUCERS AGENCY OF CALIFORNIA

Total Supply, Demand, and Stocks

Total supply in November was 1,392,000 b/d, 1,000 b/d less than October's 1,388,000 b/d but 28,000 b/d more than the average of 1,359,000 b/d in November, 1959.

Preliminary figures for December indicate that total supply was 1,428,000 b/d, demand was 1,444,000 b/d, and stocks decreased 16,000 b/d. This decrease, 496,000 barrels for the month, would bring stocks to 117,589,000 barrels on December 31, compared with 126,896,000 on December 31, 1959. The year's decrease was 9,307,000 barrels.

Crude Production, Imports, and Stocks

Weekly figures for December indicate that crude production was 833,000 b/d, imports were 329,000 b/d, and stocks dropped 23,000 b/d. This decrease, 713,000 barrels, would bring stocks to 30,782,000 barrels on December 31, compared with 34,275,000 on December 31, 1959. The year's decrease was 3,493,000 barrels.

Gasoline Supply, Demand, and Stocks

Preliminary figures for December indicate that gasoline supply was 590,000 b/d, demand was 547,000 b/d, and stocks increased 43,000 b/d. This increase, 1,333,000 barrels for the month, would bring stocks to 31,677,000 barrels on December 31, compared with 31,853,000 on December 31, 1959. The year's increase was 824,000 barrels.

Distillate Fuel Supply, Demand, and Stocks

Weekly figures for December indicate that distillate fuel supply was 224,000 b/d, demand was 260,000 b/d, and stocks dropped 36,000 b/d. This decrease, 1,116,000 barrels for the month, would bring stocks to 14,864,000 barrels on December 31, compared with 15,044,000 barrels on December 31, 1959. The year's decrease was 180,000 barrels.

Residual Fuel Supply, Demand, and Stocks

Preliminary figures for December indicate that residual fuel supply was 300,000 b/d, demand was 342,000 b/d, and stocks dropped 42,000 b/d. This drop, 1,302,000 barrels, would bring stocks to 14,808,000 barrels on December 31, compared with 22,236,000 on December 31, 1959. The year's decrease was 7,428,000 barrels.

Union Oil Co. Earnings Jump 25 Per Cent

Union Oil Company of California reported preliminary earnings for the year 1960 of $34,000,000, or $3.95 per share on the 8,709,807 common shares outstanding.

This represents an increase of 25% over 1959 earnings of $27,515,000, or $3.16 per share on the same number of shares.

Richfield Joined by Sinclair in Alaska

Sinclair Oil and Gas Company and B. P. Exploration Company (Alaska), Inc., have joined Richfield Oil Corporation in exploratory operations in the Katalla-Yakataga area of the Gulf of Alaska, the companies announced recently.

An option to acquire a one-half interest in the operation was exercised by Sinclair, and one-half of Sinclair's interest was assigned to B. P. Exploration (Alaska), Inc. (a subsidiary of the British Petroleum Company group). Richfield will be the operator.

Operations are being conducted under two development contracts, covering approximately 1,060,000 acres, granted Richfield in 1959 by the United States Department of the Interior.

The first well, Richfield's Kaliakh Number One, was spudded in late 1959 and drilled to 14,699 feet. Protective casing was set, in case information gained from subsequent wells called for further deepening or testing, and the well was suspended in June, 1960.

The second well, Kaliakh Number Two, located two miles north of the first well, was spudded in mid-1960, drilled to a depth of 9,575 feet, plugged back to 4795 feet and is now directionally redrilling below 11,000 feet.

The Development Contract lands lie along the coast of the Gulf of Alaska, east of Copper River and west of Icy Bay. The well sites are three and five miles north and 18 miles west of the Yakataga Federal Aviation Agency station.

Schlumberger's Oldest Employee Honored

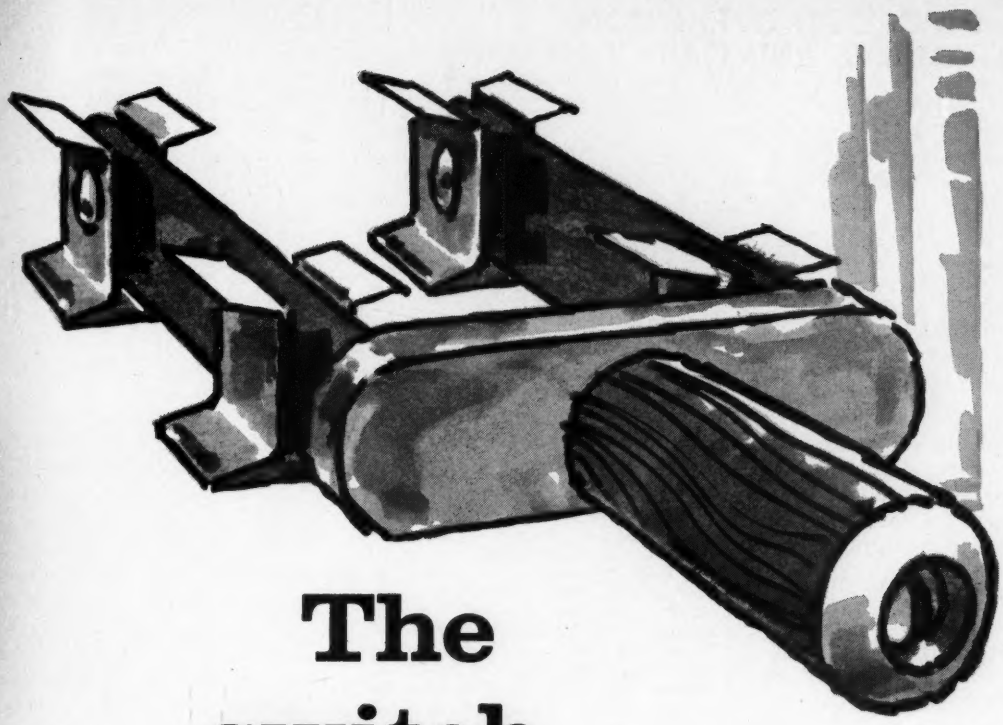
During December, Jacques H. Gallois of Bakersfield celebrated his 40th year of association with the Schlumberger Well Surveying Corporation, a company he introduced to Bakersfield in 1933.

Recently Mr. Gallois traveled to the firm's headquarters in Houston, Texas, to attend a banquet held in honor of the occasion. He accepted a diamond-studded service pin from Schlumberger's president, W. J. Gillingham. Only one other man has as much seniority with the company as does Mr. Gallois.

J. H. Gallois (second from right) is presented his 40-year service pin by E. G. Leonardon, member of the Schlumberger Board of Directors and the firm's oldest employee. Also on hand for the presentation are H. G. Doll, Chairman of the Board, and W. J. Gillingham (far right), President of Schlumberger Well Surveying Corporation.

One of the best-known men in California's oil drilling industry, Mr. Gallois is a native of France and an engineering graduate of the University of Paris. After joining the small geophysical consulting firm operated by the Schlumberger brothers in Paris, Mr. Gallois began a life of travel that took him to Africa, Russia, Canada and Spain. He first came to the United States in 1925 and returned in 1933 to open an office in Bakersfield for his growing company. He has remained there ever since.

A top expert in the field of electrical well logging, Mr. Gallois enjoys a following of oil men who will accept no advice but his in the analysis of their wells. He is presently a senior sales engineer attached to the Pacific Coast Area.



The switch is on...

to electric oil well pumps

The trend in Southern California oil fields is toward electric oil well pumps. Small wonder:

Electric Pumps are dependable—fewer moving parts reduce the chance of breakdown and require less maintenance.

Electric Pumps are safe—they eliminate the fire and explosion hazards of combustion engines.

Electric Pumps are economical—automatically controlled, they require less supervision and save you labor costs.

Electric Pumps are quiet—in a residential area, their silent operation contributes towards better community relations.

These are just some of the reasons why progressive oil producers in Southern California are switching to electric pumps. For the complete story, call any Edison office. One of our power consultants will be glad to furnish you details. There's no obligation, of course.

SOUTHERN CALIFORNIA Edison COMPANY

FOREIGN OPERATIONS
SIGNAL OIL AND GAS COMPANY

Venezuela

During 1960 Signal Oil and Gas of Venezuela produced a total of 9,500,000 barrels of crude from a 27,000-acre concession in Lake Maracaibo, Venezuela. Three new wells were completed in 1960 before drilling operations were temporarily suspended in March.

In August of 1960 a cooling system for all of the production was put into operation. By virtue of this installation an additional 1,000 b/d of oil is being recovered and the gravity of the combined oil is raised one degree. At year's end 21 wells were producing a total of 24,000 barrels per day of 34° gravity oil.

Drilling operations on this concession began in May, 1957. Initial production was in October, 1958, at which time six wells had been completed. Total production to the end of 1960 is 20,000,000 barrels of crude.

Signal of Venezuela and Hancock of Venezuela each own 25 per cent of the concession. Signal is the operator and concessionaire.

Iran

Total Consortium production was approximately 356 million barrels, of which approximately 110 million barrels were processed in the Abadan Refinery.

Signal International, a wholly owned subsidiary of Signal Oil and Gas Company, holds a 0.8333% interest in the Iranian Oil Consortium.

Signal owns a 30.16% interest in American Independent Oil Company, whose wholly owned subsidiary owns a 0.8333% interest in the Iranian Oil Consortium.

Among the major developments in the Consortium area during 1960 was the inauguration of the Kharg Island marine terminal located 25 miles off the Iranian mainland in the Persian Gulf. Receiving Gach Saran crude oil from nearly 100 miles away, the 26-30 inch pipeline connecting the field to the terminal travels some 26 miles on the floor of the Persian Gulf — the longest submarine pipeline yet laid. The pipeline is capable of transporting 390,000 barrels of oil per day over this distance. The tank farm on the island has a storage capacity of approximately 2.7 million barrels. The terminal can accommodate the world's largest ocean-going tankers.

Bolivia

Early in 1961 a deep test is to be drilled by others as a direct offset to a block of slightly over 1,000,000 acres in which Signal holds a one-third interest. The well is located in the Santa Cruz area about 60 miles southeast of a significant discovery of high gravity oil announced in the fall of the year, and is to be drilled on the large El Dorado anticline, which was delineated by geophysical methods. As 1960 ended, the drill site, along with supporting road, camp and airstrip, was being prepared.

Editor's Note: Foreign operations have become of prime importance to many of our local companies whose original activities were chiefly domestic in scope. Believing that this subject is of general interest to the industry, California Oil World will run monthly stories dealing with West Coast companies' foreign activities. This is the second article of this series. The first appeared in our January 15th issue.

The location is about 45 miles south of Santa Cruz in eastern Bolivia. The well is to be drilled by Gulf Oil Corporation as operator and with Pure Oil participating. The well is an offset to acreage in which Signal, Pure and Sohio each have a one-third interest.

The projected depth is 13,000 feet.

Guatemala

Preparations are being made for a well to be drilled in the first quarter of 1961 on the large Canchachan structure in central eastern Guatemala. The well is to be drilled by Signal on a drilling-block of about 30,000 acres, in which Signal will have a 100% equity. The block is enclosed by a 1,350,000-acre unit in which Signal has a 50% interest. The rig will be landed at an eastern Guatemala port, transported by barge up the Sarstun River and then pulled by tractor over a road for about 30 miles to the rig site. Special equipment for the drilling venture can be brought in by air transport to the airstrip at Poptun, a small village, and then trucked about 5 miles south to the site.

During the year three exploratory tests were drilled in Guatemala by others. Interesting shows of oil and gas were encountered but no commercial production was found.

Canada

Signal holds a 25% interest in a joint venture exploring over a million acres of the Northwest and Yukon Territories on farmout from Canada Southern Petroleum Ltd. Other participants are Home Oil Ltd., Kern County Land Company and Alminex Ltd. Home Oil is the operator.

All operations are carried on during the winter season while the muskeg and rivers are frozen. The area is inaccessible to normal means of transportation after the spring thaw. Access to the area is over the Fort Simpson winter trail from Fort Nelson, British Columbia.

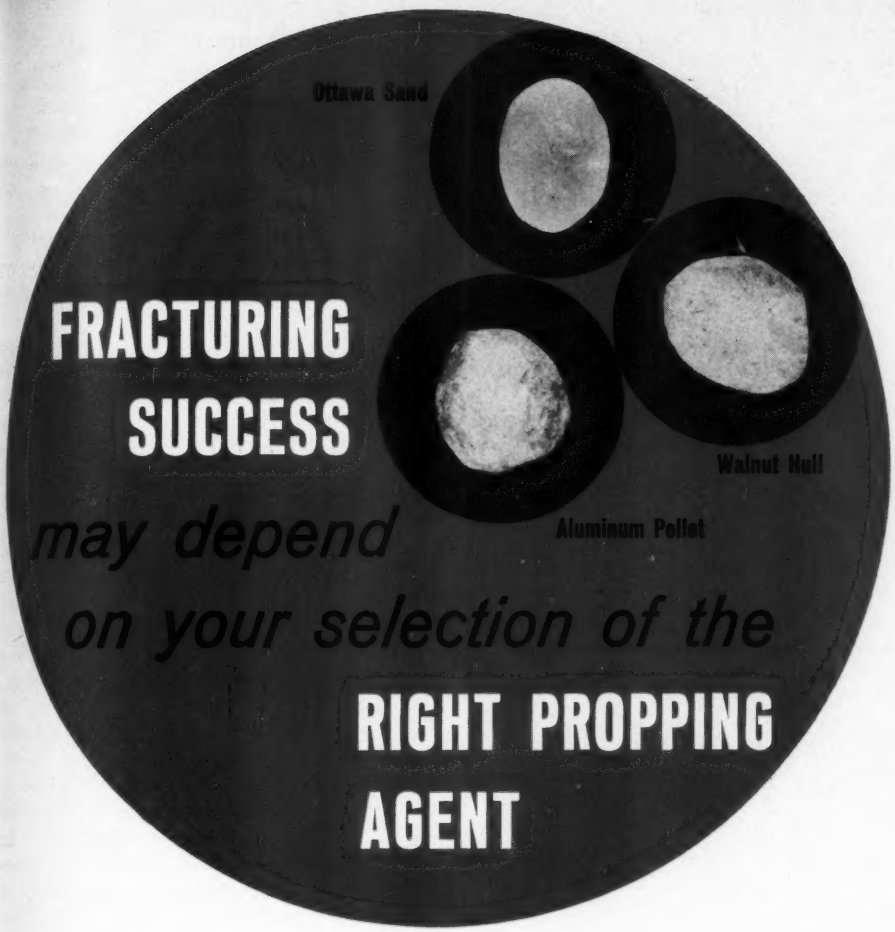
The first two wells were drilled during the 1959-1960 winter season. One was a dry hole, while the second was completed as a gas well. The wells are located about nine miles north of the British Columbia-Northwest Territory boundary and about 90 air miles north of Fort Nelson.

The group hopes to drill four wells during the current season if cold weather conditions prevail. The first of these was spudded December 29, 1960, and the second shortly after the first of January, 1961. These wells are located in the same general area as the two drilled during the past season.

Argentina

South American Development Co. (SADCO), a wholly owned Signal subsidiary, holds an undivided 20% interest in a joint venture operating under contract with the Argentine government oil agency, YPF. Exploration and development work was started in early 1959 on three areas in Mendoza Province totaling about 115,000 acres. Exploration in a 1,500,000-acre block in the Comodora Rivadavia Basin of Santa Cruz Province began in December of 1959.

Through November, 1960, a total of 121 wells had been drilled, of which 101 were completed as oil and/or gas producers. The bulk of these wells were in the La Ventana Field, Mendoza, where 70 wells have been completed out of a total of 76 drilled. The Punta Bardas area (adjacent to La Ventana on the south) accounts for most of the remaining wells, with 27 producers and seven



FRACTURING SUCCESS may depend on your selection of the RIGHT PROPPING AGENT

These three photomicrographs represent the business end of a fracturing job. These particles have to keep the fracture open when the treating pressure is released. Enlarged several times, they may even look alike . . . but they don't *act* alike! Knowing which one will work *best* in your well may mean the difference in the success of the treatment.

On top of the heap is a grain of Ottawa Sand, the most popular type of propping agent used today in formation fracturing. In many formations, sand grains will adequately prop the fracture to permit increased reservoir drainage. However, formation characteristics may be such that sand grains will crush and shatter or embed, allowing the fracture to "heal" . . . what then?

The answer to these conditions frequently lies with the other two propping agents shown above. Aluminum pellets, or processed walnut hulls will not normally shatter under extreme loading. Instead, they tend to deform to a wafer-like shape, still providing propping support for the opened fracture.

Your Halliburton man will be glad to assist in having a core sample from your well tested so you may select the best propping agent for a particular formation. See him before planning your next fracturing treatment.

FIRST . . .

AND FOREMOST

IN FORMATION

FRACTURING

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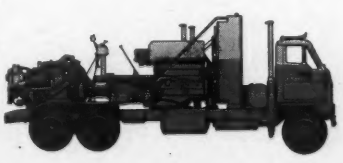


dry holes. The Comodora Rivadavia area is still under exploration and test drilling is being continued in 1961.

Daily production, all from the Mendoza area, had risen to nearly 26,000 bbls. by the end of November. Cumulative production to that date was approximately 9 million barrels of 31 gravity oil.

Loeb Rhoades Development, Limited, is the operator of the venture.

FREE WORLD PICTURE

It might be of interest to interrupt our reports of foreign activities of California oil companies to take a quick look at the Free World picture in 1960 compared to 1959.

In exploration and developmental drilling there was little increase in free foreign activity — some 8,000 wells compared to 7,900 the previous year. This was due to the soft price climate. In new areas, such as the French Sahara, Libya, offshore Neutral Zone and Argentina, significant volumes of new supply were developed.

Two new pipelines are delivering Sahara crude to the Mediterranean. One is a 400-mile line from Hassi-Messaoud to Bougie, Algeria, completing its first year of operation; present capacity, 180,000 b/d. The other, opened in October, 1960, runs 480 miles from In-Amenas to Skirra, Tunisia; present capacity, 140,000 b/d. In Europe a 185-mile line from Rotterdam to the Rhine-Ruhr area was completed in June, 1960, with initial capacity of 170,000 b/d.

Conditions for foreign tankers improved in the last quarter of 1960, with more owners able to find employment for their tankers at slightly improved rates. The U. S. flag tanker market remained unchanged during the year.

During the year there was a large increase in the number of older and smaller tankers sold for scrappage. The construction rate of new large tankers was slower than for the two previous years, but still equal to 10% of the existing fleet at the start of the year.

Refinery runs in free foreign countries were up over 11% in 1960 to 9,700,000 barrels per day. U. S. refinery runs were up only 1%.

Petroleum demand in free foreign countries increased 11% in 1960 over 1959 to 9,100,000 b/d. This compares with total demand in the United States of 9,650,000 b/d, up 2.1%. This strongly illustrates the continued expansion in the need for energy in the Free World outside the United States.

Tapline

Trans Arabian Pipe Line Company has completed 10 years of operation. Ownership is 30% each for Standard Oil Company of California, Texaco, and Jersey Standard, with Mobil having a 10% interest. This extends over 750 miles in an almost straight line from Quisumah, Saudi Arabia, through Jordan and the Syrian Province of the United Arab Republic into Lebanon. It is a 30"-31" line. Two and a half years in the building, it originally cost $176,000,000, but would cost more than a quarter billion dollars to replace.

During the decade over 1,160,000 barrels of oil were transported from Saudi Arabia to the terminal at Sidon, Lebanon. This is a daily average of 316,000 b/d. Over 8,000 tankers were loaded at the terminal. At present the line has a capacity of 470,000 barrels daily.

In an anniversary message, President John Noble pointed out two problems which, when overcome, would allow the line to reach its full capacity potential. First was the current surplus of tanker capacity and depressed tanker rates which face Tapline with serious competition. Second was modification of the company's agreements with governments which would at the same time safeguard the rights and interests of the peoples of these countries while preserving the company's economic welfare.

Camdrill International Inc.

This company is operating in Libya under nine drilling contracts with the large American companies there. It is expected that these operations will continue on a profitable basis. Camdrill, in a joint venture referred to as Camdrill-Citra, recently moved equipment into the Spanish Sahara, on the West Coast of Africa, under a drilling contract with Union Oil of California and its associates. Camay, under the Citra-Camay joint venture, is still operating in Algeria. This operation has one idle rig there in addition to one rig operating under contract. Citra-Camay has been working there for nearly three years under contracts with a French international oil company.

R. G. Follis Report On Standard of Calif.

R. G. Follis, chairman of the board, announced the preliminary estimate of 1960 earnings as $266,000,000 or $4.21 a share, compared with 1959 net income of $253,599,061 or $4.01 a share.

He attributed the improvement to generally higher production and sales in the Western Hemisphere, coupled with increased dividends from Eastern Hemisphere affiliates. The 20 cents a share increase is divided about equally between the two hemispheres.

Follis said he anticipates further improvement during 1961 despite the mild economic slowdown in the U. S. that is expected to persist through the spring. "For the most part," he noted, "oil industry prospects now are somewhat better than they were a year ago, with an improved relationship between demand, production and refinery runs than existed at this time last year."

Reviewing the past year's operating highlights, Follis disclosed that their world-wide gross production of crude oil and natural gas liquids averaged an estimated 985,000 barrels daily, and in the last several months exceeded a million barrels a day for the first time in history.

Production increased 7 per cent in the Western Hemisphere and 11 per cent on a world-wide basis.

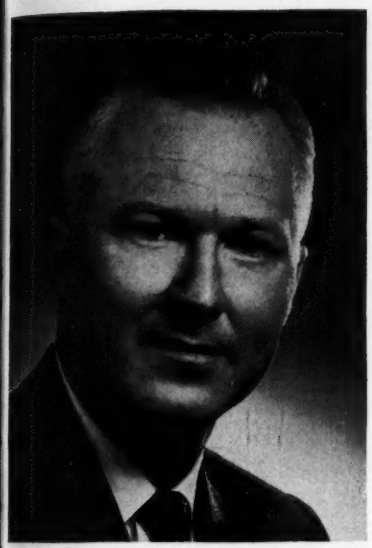
Marketing results in various categories again exceeded the company's all-time highs, with petroleum product sales volume up by 7 per cent in the Western Hemisphere and natural gas sales up 23 per cent. Sales of industrial and agricultural chemicals amounted to $155,000,000, an increase of 8 per cent.

Follis also reported the company made substantial progress in streamlining its operations during 1960.

Expenditures for capital and exploratory purposes are expected to be over $400,000,000 in 1961, Follis said, compared to some $370,000,000 in 1960. Nearly two-thirds of the outlay will go for exploration and development of crude oil resources.

"While a world-wide surplus in oil persists in some measure at this time, long experience demonstrates the importance of continuing exploration and development to assure adequate supplies for future growth," he observed.

Personalities IN THE NEWS



Donald I. Lawless

Donald I. Lawless Succeeds L. J. Brunel as Pres. of Bishop Oil

Louis J. Brunel, who has been an officer of Bishop Oil Company since 1927, retired as president of the company January 26.

The board of directors elected geologist **Donald I. Lawless,** vice president of Canadian Bishop Oil, Ltd., to succeed him. The board also increased its size from seven to eight to make Lawless a director.

Brunel will continue as a director and serve the company in a counseling and advisory capacity. He reached retirement status on Jan. 1.

Brunel served as vice president and general manager of Bishop for 32 of his 35 years with the company, becoming president in 1959. He has been a member of the board of directors since 1927, and president of Canadian Bishop since 1957.

The board of Canadian Bishop, meeting concurrently, also named Lawless to succeed Brunel as president of the subsidiary.

Lawless joined Bishop in 1948 as geologist in Wichita, Kansas, after working as geologist for other oil producers in the Wichita area. He was named district geologist for Bishop in 1949, and chief geologist in 1950.

In 1952 he transferred to Alberta, Canada, as manager of exploration for Canadian Bishop Oil, Ltd., returning to the United States in 1954 as mid-continent division manager for the parent company. Three years ago he went back to Canada as vice president of the subsidiary.

T. P. Pike New President of Republic Supply Company

The Republic Supply Company of California has announced appointment of **Thomas P. Pike** to succeed **John J. Pike** as company president.

Prior to his appointment as president, Pike had been named chairman of the board in December, 1960, a position which he retains. He also serves as a director for Hewlett Packard Co., National Engineering Science Co., Casualty Insurance Co., and Lincoln Savings & Loan Association.

Pike joined Republic in 1931 as a warehouseman, later becoming a salesman and sales manager. Seven years later he formed Thomas P. Pike Drilling Company, which became active in the California petroleum industry. In 1953 he went to Washington, D.C., as deputy assistant secretary of defense, supply and logistics. Later he served as special assistant and consultant to President Eisenhower.

Signal Names New Gas Department Manager

James B. Taylor has been appointed to the new position of general manager of Signal Oil & Gas Company's gas department, it was announced by **R. W. Heath,** senior vice president.

In a general reorganization of the company's gas department, **Paul Chambers** has been transferred from Tulsa to Los Angeles to become assistant to the general manager.

R. L. Cook has been appointed manager of operations, **Harvey Menard** has been named manager of joint interests, and **David R. Arnold** is manager of engineering and construction.

Armstrong Named Halliburton Vice President

Turner Armstrong has been named vice president of Halliburton Company in charge of the Welex Division. His election to the new post follows Welex's merger into Halliburton, from a wholly owned but independently managed subsidiary corporation to an operating division.

Turner Armstrong

Armstrong joined Halliburton in 1940 after graduating from the University of Oklahoma with a B.S. degree in electrical engineering, and has since worked in Mid-Continent and California operations. Most recently he was a vice president of the Welex subsidiary, until its merger with Halliburton.

The Halliburton vice president will be based at Houston, which will be headquarters for Welex.

Erskine, Ritchey Promoted By Continental-Emsco Company

Robert M. Erskine has been appointed to the newly created position of assistant general manager, sales—non-tubular, of Continental-Emsco Company.

Erskine, former manager of subsurface equipment sales, began his employment with Continental-

Robert Erskine Jim Ritchey

Emsco in 1953 as a sales engineer.

Replacing Erskine as manager of subsurface equipment sales is **Jim Ritchey.** Ritchey, former D+B special representative, started with Continental-Emsco in 1953. He has also served the company as a district D+B specialist.

Pacific Lighting Gas Supply Co. Rearranges Top Officers

Election of **W. M. Jacobs** as president of Pacific Lighting Gas Supply Co. was announced recently, following action by the natural gas transmission and storage utility's board of directors.

Robert A. Hornby, current president, was elected chairman of the board of P.L.G.S. He succeeds **Robert W. Miller,** who will resign as board chairman of P.L.G.S. but remains as board chairman of Pacific Lighting Corp., parent of P.L.G.S. and of Southern California and Southern Counties Gas Cos. Hornby also will continue as president of the parent company.

The changes in assignments of top executives of the Pacific Lighting Corp. subsidiary, effective January 1, permit Miller and Hornby to devote more of their time to the problems of the integrated Pacific Lighting system as a whole, it was emphasized. At the same time, the changes give P.L.G.S., in Jacobs, a man well qualified for his new function, both by his ability and wide experience in the public utility business and the Pacific Lighting system.

Mobil Oil Makes Personnel Changes

Major changes in the organizational structure of the West Coast Pipe Lines of Mobil Oil Company, effective Feb. 1, were announced recently by **J. S. Black,** manager.

H. W. Witter, presently assistant to the manager, has been appointed manager of operations. He is responsible for all field operations and is now headquartered at Mobil's Torrance, Calif., refinery.

Pipeline operations under the new setup were organized into six geographical areas; three in the San Joaquin Valley and three in the Greater Los Angeles Basin. Named as area supervisors were **R. E. Dafoe, C. A. McDonald, J. W. Hazzard, G. F. Pitzer, A. W. Lemberger and C. A. Rhoton.**

J. B. Goza, formerly division engineer of the Houston Division of Magnolia Pipe Line Company, has been appointed manager of engineering for West Coast Pipe Lines.

Magnolia is the common carrier affiliate of the Mobil organization.

W. C. Meek, presently supervisor of rights-of-way, surveying and mapping, became manager of rights-of-way and claims.

W. H. Webb was named manager of oil movements with headquarters in the Mobil Building, Los Angeles. Members of his oil dispatching group were transferred from the downtown location to Torrance following completion of necessary communication facilities.

C. D. Grant is now Black's administrative assistant in charge of the clerical and accounting activities of West Coast Pipe Lines.

D. P. Dowling, formerly administrative assistant, employee relations department, Magnolia Pipe Lines, was transferred to Los Angeles as manager of employee relations for the West Coast Pipe Lines.

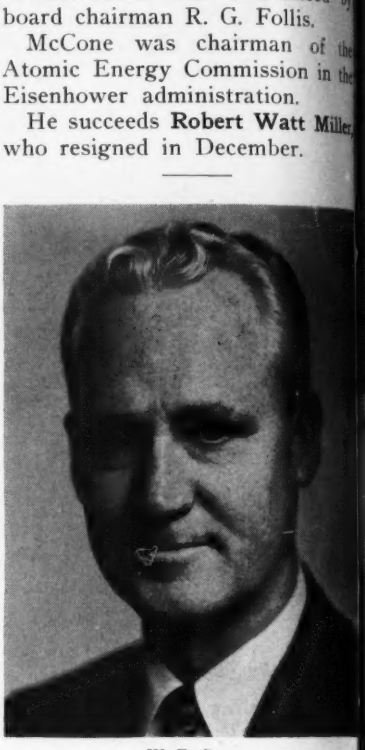
West Coast Pipe Lines is responsible for the transportation of crude oil and finished products for Mobil via a network of pipelines between producing areas, refining and processing installations, marine terminals and storage locations in Southern California.

John A. McCone Elected Director of Standard of Calif.

Election of **John A. McCone** as a director of Standard Oil Company of California was announced by board chairman R. G. Follis.

McCone was chairman of the Atomic Energy Commission in the Eisenhower administration.

He succeeds **Robert Watt Miller,** who resigned in December.



W. E. Avery

Texaco Elects Two Officers

Augustus C. Long, chairman of the board of Texaco Inc., recently announced the election of **Wallace E. Avery** as vice president in charge of the company's West Coast operations, effective May 1.

Avery, who has been secretary of Texaco since 1956, will make his headquarters at Los Angeles.

Maury L. Nee, formerly director of the budget, has been elected secretary to succeed Avery, Mr. Long said.

Avery joined Texaco in 1945 as an attorney in the Los Angeles office. In 1951 he was made assistant general manager of the Employee and Public Relations Department with headquarters in New York, and in 1954 became assistant secretary of the company.

Nee joined Texaco in 1957 as an executive assistant in the company's Finance and Economics Department and was named assistant to the vice president in charge of Trinidad operations a year later. In 1959 Mr. Nee became director of the budget

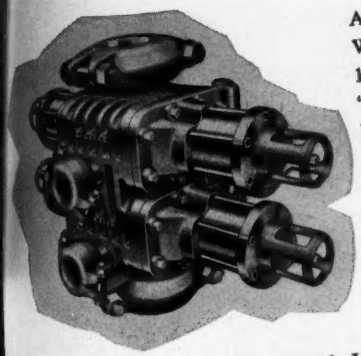
LATEST SHAFFER "LWS" ADVANCEMENTS MARK NEW ERA IN BLOWOUT PREVENTERS

With modern drilling programs constantly probing into more and more remote areas of the globe, it was inevitable that blowout preventer equipment would eventually become lighter in weight, easier to handle and transport—*without sacrificing pressure handling abilities or basic operating features.*

Shaffer, pioneer in pressure-control equipment, recognized this need several years ago and initiated a major research and development program in lightweight control gate designs. This program led to development of the initial Shaffer "LWS" Preventers—units that offered adequate pressure protection for production and re-work applications, yet weighed approximately one-half as much as comparable equipment then available.

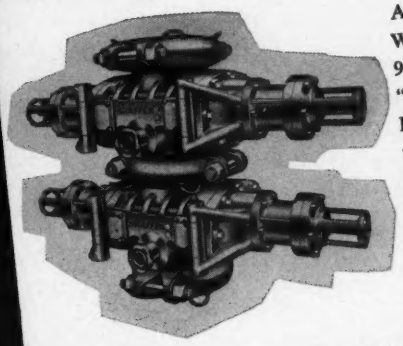
Now Shaffer has taken another major step ahead of the field with announcement of these two additional "LWS" Preventers having even higher pressure ranges than the original "LWS" units, coupled with important savings in weight that assure lower transportation costs and greater handling ease . . .

6"—5,000# W.P.



A new 6"—5,000# W.P. (6" Series 1500) Shaffer Type "LWS" Hydraulic Blowout Preventer with a *Working* Pressure of 5,000 PSI (*Test* Pressure of 10,000 PSI) and a 7-1/16" Bore. This unit is available in both *Single* and *Double* designs—and the Double Unit has a total weight of only 2,610 lbs. (as compared with the 5,700 lb. weight of comparable equipment heretofore available). *That's a saving of 55% in weight—with no sacrifice in operating features!*

10"—3,000# W.P.



A new 10"–3,000# W.P. (10" Series 900) Shaffer Type "LWS" Hydraulic Blowout Preventer with a *Working* Pressure of 3,000 PSI (*Test* Pressure of 6,000 PSI) and an 11" Bore. This unit, also, is available in both *Single* and *Double* designs—and the Double unit has a total weight of only 3,850 lbs. (as compared with the 6,965 lb. weight of comparable equipment heretofore available). *That's a saving of 45% in weight!*

All the above "LWS" Preventers incorporate the latest Shaffer advancements . . . **Swinging END-Opening Doors** for quick, simple ram changes without loss of operating fluid—**Positive Direct Hydraulic Drive** with each ram on the same shaft as the operating piston (no levers, yokes or other complex connections) . . . **Quick-Drain Ram Compartments** that prevent detrimental accumulation of mud and sand—*and many other unique advancements found only in Shaffer Preventers.*

Whether your operations are in remote areas where transportation is a problem, or in domestic fields where the easier installation and handling advantages of lightweight equipment are important, it will pay you to investigate Shaffer Type "LWS" Gates for *your* operations. See your nearby Shaffer representative for complete details —or write direct!

SPECIFICATIONS ON POPULAR SIZES OF SHAFFER TYPE "LWS" BLOWOUT PREVENTERS

Nominal API Size	Working Pressure	Test Pressure	Vertical Bore	Approx. Weights		Approx. Saving in Weight*
				Single	Double	
6"—3,000# W.P. (6" Series 900)	3,000 PSI	6,000 PSI	7 1/16"	780 lbs.	1,420 lbs.	67%
6"—5,000# W.P. (6" Series 1500)	5,000 PSI	10,000 PSI	7 1/16"	1,410 lbs.	2,610 lbs.	55%
8"—3,000# W.P. (8" Series 900)	3,000 PSI	6,000 PSI	9"	1,100 lbs.	1,950 lbs.	64%
10"—3,000# W.P. (10" Series 900)	3,000 PSI	6,000 PSI	11"	2,100 lbs.	3,850 lbs.	45%

*As compared with comparable equipment now in use.

Write Shaffer Tool Works for information on larger bore sizes.

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HIGH PRESSURE DRILLING AND CONTROL EQUIPMENT • FISHING TOOLS THAT EXCEL

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Magcobar Entertains

John E. Lyons, vice president of Magnet Cove Barium Corporation, Houston, Texas, tossed a fine buffet dinner and cocktail party at the Petroleum Club of Los Angeles towards the end of January, for the purpose of introducing the recently reorganized West Coast subsidiary, Magcobar Pacific Mud Company, and its personable president, Jim B. Hill. This was a thoroughly enjoyable affair, hosted jointly by John, Jim, and their respective lovelies, Joan and Frances, and attended by many high-echelon oilmen and their ladies. John Lyons is an uninhibited Louisianian with an endless fund of Cajun folklore which he dispenses in authentic dialect most amusingly, and Jim Hill is definitely one of our more likable citizens, so the guests were well entertained in the lush atmosphere of the Petroleum Club.

Among those in attendance were James C. Kelley and the John B. Isaacs of Hillman-Kelley; Dave Carnahans, Hydril; Tom Hammers, Drillex; Tom Johnstons, Johnston Oil Tool Co.; Kenny Dales and Larry Liedholms, Signal Oil & Gas Company; Clyde Simpsons, Simpson Drilling Co.; Kinzie Millers, California Oil World; Ben Baylisses, Lloyd Corporation; Douglas Kingmans, Mobil Oil Co.; Barney Aggers, Santa Fe Drilling Co.; N. N. Joneses, Humble Oil & Refining Co.; Rex Hensels, George Borchards, Owen Coopers, and Blue Lauderdales, Shell Oil Co.; Karl Kreigers and Cec Martins, Richfield Oil Corp.; Melroy Welches and J. O. McDonalds, Sunray Midcontinent Oil Co.; Cleron Hendersons, Continental Oil Co.; Gregg Kildow II, Magcobar, Denver; Pat Fazio, Denis J. Gleason and Paul J. Rigali, McCulloch Oil Corp.; Fred Maloneys, Texaco Inc.; Wally Mitchell, Ed Buckley, J. M. Conners, J. Earle Grays, Pretz Hertels, H. H. Neels, E. E. Tuckers and John Wents, Jrs., Tidewater Oil Company; and a trio of competent signer-uppers, Eva Rollins, Magcobar; Irene Comstock, Camay Drilling Co., and Helene Summers, Bell Petroleum.

Magcobar executives at party. Left to right: Gregg Kildow II, Jim B. Hill and John E. Lyons.

Guests at Magcobar Pacific Mud party, left to right: Clyde Simpson, Mrs. Simpson, Jim Hill, Kenny Dale, Mrs. Kenny Dale, Mrs. John Isaacs and Blue Lauderdale.

Others attending Magcobar's festivities were, left to right: Paul Rigali, Mrs. Rigali, Jim Hill, Denis Gleason, Mrs. Gleason, Mrs. Pat Fazio and Pat Fazio.

Sidney Powers Memorial Medalist Named

Clarence L. Moody, consultant, Houston, has been chosen to receive the Sidney Powers Memorial Medal, highest honor in petroleum geology, Ben H. Parker, president of The American Association of Petroleum Geologists, announced recently.

Mr. Moody is the 14th recipient of this award, established in 1943 and made in recognition of distinguished and outstanding contributions to, and achievements in, petroleum geology. Formal presentation of the gold medal and scroll will be made Tuesday, April 25, 1961, at the 46th annual meeting of the Association in Denver, Colorado.

Fifteen Calif. Oilmen On I.P.A.A. Board

New officers and directors of the Independent Petroleum Association of America, who assumed office this month, include 15 Southern California oilmen.

Chester F. Dolley, president of Atlantic Oil Company, Los Angeles, will serve the national trade organization as vice president for Southern California.

Newly elected to serve on the national board of directors during the 1961 calendar year were: J. Russell Sherman of Lloyd Corporation, Ltd., and Lowell Stanley, both of Beverly Hills; F. E. Fairfield and Wilbur Harrison, both of Long Beach. Los Angeles newly elected directors are L. L. Aubert, vice president, Signal Oil & Gas Company; Stark Fox, executive vice president, Oil Producers Agency of California; R. L. Packer, president, Bell Petroleum Company; H. W. Thompson, president, Westates Petroleum Company; and Leland K. Whittier, president, Belridge Oil Company.

Re-elected board members include five Los Angeles men: E. E. Pyles, Monterey Oil Company; Lee S. Osborne, vice president, Union Pacific Railroad Company; James C. Kimble, president, State Exploration Company; W. H. Geis, Thornbury & Geis; and J. M. Feldman, president, Golden Bear Company.

Col. Alvin C. Hope, San Antonio, Texas, oil producer, begins his second term as president of IPAA.

The Independent Petroleum Association of America represents the domestic oil and natural gas producing industry in all phases of government relations at the national level.

James Wanvig Speaker at San Francisco D. & D. Club

James L. Wanvig of the law firm of Pillsbury, Madison and Sutro was the guest speaker at the dinner meeting of the Desk and Derrick Club at Gino's on February 8. Wanvig spoke on "Tide and Submerged Lands—Who Owns What?"

He joined the above firm in 1950 and specializes in advising clients on legal problems connected with oil and gas operations, particularly exploration and producing, involving land and title problems, including the dispute over ownership of tide and submerged lands.

U. P. Railroad Builds Gasoline Plant in Wyoming

A plant for the recovery of gasoline and other products from the natural gas available from oil wells in the Patrick Draw field in Wyoming is to be built and operated by Union Pacific Railroad Co.

The announcement by Lee S. Osborne, chief executive officer of the company's Natural Resources Division, said that although several details are still to be resolved, equipment and materials are on order and work is in progress. He disclosed that completion is expected within six months of a plant capable of processing 27,000,000 cubic feet of gas per day.

In addition to the salable dry gas, anticipated recovery of liquid fuel is between two and three gallons of gasoline, propane and butane per 1000 cubic feet of gas from the wells.

The plant will be built, it was stated, in the field about 40 miles east of Rock Springs.

Gas to be processed at the adsorption plant will come from the oil wells of five producing companies in the field. Besides Union Pacific, they are Gulf Oil Corp., Forest Exploration Corp., Texaco Inc., and El Paso Natural Gas Products.

It was said that Union Pacific and the other operators have been considering the project for some time and are able to proceed now that development has established the extent of the field and the necessary capacity of the plant.

Mobil Oil Company Earnings Up 11%

The consolidated net income for 1960 of Socony Mobil Oil Company, Inc., is estimated at $182.5 million, Albert L. Nickerson, president, announced February 1. This is 11 per cent higher than 1959 earnings of $164 million.

The 1960 estimated net earnings are equivalent to $3.76 a share based on the average of 48,592,322 shares outstanding during the year. This compares with $3.38 a share in 1959 on the average of 48,507,250 shares outstanding in that year.

I. G. Morgan Dies

I. G. Morgan, vice president and chief executive officer of Texaco Inc. at Los Angeles, died January 19 of a heart attack while addressing an oil industry meeting at the Statler-Hilton Hotel in Los Angeles. Mr. Morgan was 56 years old. A native of Belton, Texas, he attended Baylor College, Waco, Texas, where he received a teacher's certificate.

After serving as principal of the Holland, Texas, High School, he was manager of a retail store in Houston until 1931, when he joined Texaco as a service station salesman. He held increasingly responsible sales positions in various cities in Texas, and in 1938 was made assistant division sales manager in Houston. He served in the same capacity in Dallas from 1942 to 1945 and in Atlanta from 1945 to 1947.

Mr. Morgan was appointed manager of the Dallas sales division in 1947 and six years later was promoted to assistant general sales manager of Texaco's Pacific Coast Region with headquarters in Los Angeles. He was named general sales manager of the Pacific Coast Region in 1959, and was elected vice president in charge of domestic sales in 1960, with headquarters in New York. In May, 1960, he was transferred to Los Angeles and on September, 1960, was named to his present position as vice president and chief executive officer at Los Angeles.

He is survived by his wife, Gussie C., and a daughter, Helen, a student at the University of Texas, Austin, Texas.

Field Development

LOS ANGELES BASIN

Deep Test to Redrill

Standard Oil Company's deep test of the Huntington Beach Town Lot area, Huntington-B No. 167, drilled to 10,040 feet and was plugged back to redrill from 3100 feet. The test is located at the intersection of 23rd Street and Ocean Avenue.

Seal Beach Development Well

Hellman Estate is grading rig site for Well No. 59, a field development well located in the northwest quarter of Section 12-5s-12w.

Honor Rancho Development Test

Texaco Inc. is grading rig site and roads for Honor Rancho A (NCT-2) No. 20 to be drilled in the northwest quarter of Section 8-4n-16w.

Palmdale Wildcat Suspended

Butte Petroleum Company, Inc.'s Ruby No. 1 has suspended operations at a depth of 3805 feet. The test is located on the southeast quarter of Section 26-6n-10w two miles east of the town of Palmdale.

Sun Drilling Corp. Wildcat Test

The Sun Drilling Corp. is drilling below 1000 feet on Ayers No. 1 located on the northwest quarter of Section 9-3n-16w. The test is two miles southwest of the town of Newhall and is scheduled to be a 9000-foot test.

Castaic Junction Test Abandoned

Humble Oil & Refining Company drilled to a total depth of 13,635 feet on N. L. & F. No. 69 and after running a series of production tests, plugged and abandoned the well. Two strings of 2⅞" casing were cemented for testing, one at 13,616 feet and a second string at 13,618 feet.

Imperial County Steam Well

Joseph I. O'Neill, Jr., has spudded in on Sportsman No. 1, a 4000-foot steam well located on the southeast quarter of Section 23-11s-13e at the southern end of the Salton Sea. Santa Fe Drilling Co. has the drilling contract.

SAN JOAQUIN VALLEY

Texaco Deep Test

Texaco Inc. is drilling below 7000 feet on Buena Vista Associates No. 1 located on the northwest quarter of Section 26-31s-25e. Location for this deep test is 1½ miles west from the northwest end of the Paloma Field.

Helm Outpost Test

W. W. Holmes, Operator, of Bakersfield, is ready to move in rotary to drill Crow-Cuehlo No. 42-7 on the northwest quarter of Section 7-17s-18e. The test is on the west flank of the Helm Field, about 2000 feet from production, and will be drilled to approximately 7000 feet.

Richfield Outpost Test

Richfield Oil Corp. is drilling below 5000 feet on Tejon A No. 82-31 located on the northeast quarter of Section 31-11n-19w. The location is ¼ mile southeast of present production.

Ten Belridge Field Wells

Belridge Oil Company has staked locations for ten new development wells in the field, all on Section 28-28s-21e.

Richfield Completes Outpost Test

Richfield Oil Corp. completed KCL-H No. 21-15 flowing 395 b/d of 30.7 gravity oil cutting 0.2 per cent. Flow was from the perforated interval 13,178-13,245 feet through a 12/64" bean. Located 2000 feet southeast of San Emidio Nose production on the northwest quarter of Section 15-11n-21w, the completion was drilled to a total depth of 13,325 feet and cemented 7⅝" casing at 12,097 feet.

Universal Consolidated Wildcat Test

Universal Consolidated Oil Co. has awarded a contract to Haney & Williams to drill KCY-Coulter No. 34-25 in the northwest quarter of Section 25-30s-26e. Rig site is about ¾ of a mile south of Gosford Field production and will test the Stevens Sand at approximately 10,500 feet.

Cymric Field Development

Standard Oil Company has staked locations for seven wells in the Cymric Field. Well No. 3-11A-31X is located on Section 31-29s-22e and Sea Breeze No. 7-6 and 10-8 will be drilled in Section 6-30s-22e. Four wells are located on the McPhee lease in Section 6-30s-22e.

Shell Oil Coalinga Development

Shell Oil Company has staked locations for fourteen development wells in the East Coalinga Field. All are in Township 19s, Range 15e. Two wells will be drilled on Section 10, three on Section 14, one on Section 22, two on Section 27, three on Section 29 and three on Section 34.

Cymric Wildcat

Golden Bear Oil Company is preparing to drill Intex-Boynton No. 1, a wildcat test located south and west from the east quarter corner of Section 16-29s-21e, 3000 feet east of the Sheep Springs area.

NORTHERN CALIFORNIA

New Gas Field Discovery

Honolulu Oil Corp. completed Balsdon Unit No. 1 flowing 2250 mcf of gas per day from the perforated interval 9576-9596 feet through a 15/64" bean with pressures of 1675/1800 psi. Besides being a new field discovery, the well also developed the deepest gas production in the Sacramento Valley. Located on the northeast quarter of Section 34-14n-1w in Colusa County four miles northwest of the Buckeye Gas Field, the discovery was drilled to a total depth of 10,000 feet and has 5" casing cemented at 9735 feet.

Grimes Outpost Test

Atlantic Oil Company is moving in rotary to drill Frye Unit No. B-1 on the northwest quarter of Section 35-15n-1e in Sutter County. The rig

site is ½ mile south of Atlantic's discovery well, U. E. Frye No. 1.

Sutter County Completion

Cameron Oil Company and McElroy Ranch Company completed Grimes Operating Unit Nine No. 1 flowing 5000 mcf of gas per day from the perforated interval 6868-6858 feet and 6854-6843 feet. Flow pressure was 2280 psi and shut-in pressure was 2970 psi. Located on the southwest quarter of Section 9-14n-1e in Sutter County, the completion was drilled to a total depth of 8656 feet and has 5½" casing cemented at 8648 feet.

Solar Drilling Company Test

Solar Drilling Co. has staked location for Griffin No. 1 in the Winters area of Yolo County, in the southeast quarter of Section 1-8n-1w. The test is approximately 200 feet northwest from a well Westates Petroleum Co. completed flowing 5000 mcf of gas from the McCune Sand perforations 4712-4725 feet and was abandoned a year later.

Pauley Petroleum Gas Test

Pauley Petroleum, Inc., et al, has staked a location for Scally No. 1, a Solano County wildcat test on the southeast quarter of Section 10-4n-1w. The well is in the Potrero Hills area and will be drilled to about 3500 feet. In 1943 Richfield Oil Corp. completed Potrero Hills No. 1 flowing 5000 mcf of gas per day and later went to water. Pauley's location is approximately ½ mile to the southeast.

Rio Vista Completion

Standard Oil Company completed Correia No. 1 flowing 1850 mcf of gas per day from the perforated interval 3785-3860 feet and was shut in. Shut-in pressures were 1435/1435 psi. Located on the southwest quarter of Section 36-4n-3e in Sacramento County, the completion was drilled to a total depth of 4000 feet and cemented 4½" casing at 3944 feet.

Brown Gas Test

E. C. Brown, Operator, is preparing to spud H. D. Towne Unit No. 5, a Thornton Gas Field development well. The well is located on the southeast quarter of Section 31-5n-5e in San Joaquin County and will be drilled to about 4000 feet.

Reserve Gas Completion

Reserve Oil and Gas Company completed Liberty Farms-Reynolds No. 3 flowing 3600 mcf of gas per day from the Eocene Sand perforations 4926-4921, 4914-4911, 4905-4882, 4877-4872 feet. Flow was through an 18/64" bean with a flow pressure of 1400 psi. Located on the southeast quarter of Section 19-5n-3e in Solano County, the well was drilled to a total depth of 5395 feet and redrilled to 5000 feet. 4½" casing is cemented at 4985 feet.

Gulf Wildcat Test

Gulf Oil Corp. of Calif. is grading location for David S. Lewis No. 1 located on the southeast quarter of Section 23-13n-1e in Sutter County. The drill site is two miles southeast of the Kirk Gas Field.

West Grimes New Pool Discovery

Gulf Oil Corp. of Calif. completed F. Stapp et al No. 1 as a new pool discovery flowing 36,000 mcf of gas per day on an open flow potential test and through a ½" bean flow was 10,522 mcf with a flow pressure of 1928 psi. 5½" casing is cemented at 7942 feet and gun perforated from 6968-7022 feet. Located on the southwest quarter of Section 3-14n-

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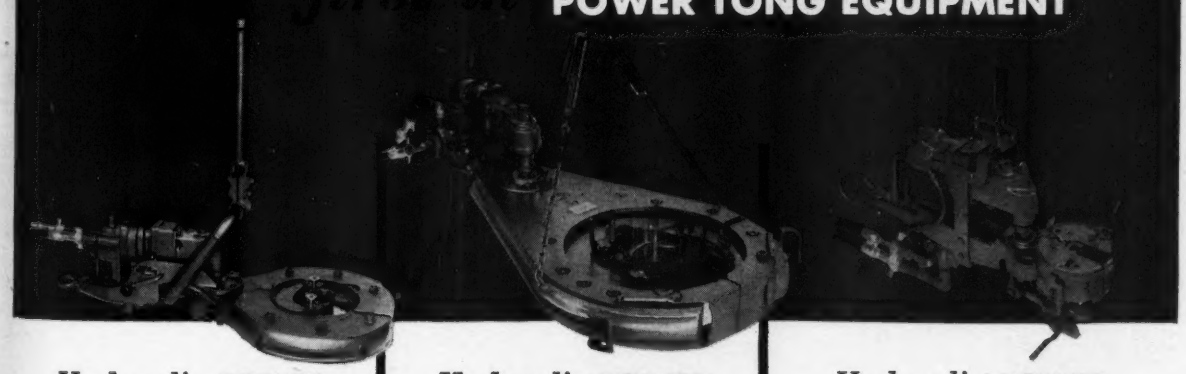

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1w in Colusa County, the completion was drilled to a total depth of 8000 feet and is five miles west of the Grimes Gas Field.

Stanislaus County Gas Test

Luard Corp. is drilling below 100 feet on Luard-Valerdi No. 1 located on the southeast quarter of Section 36-5s-6e in the Puerto Creek area. The test will be drilled to about 6000 feet and is 15 miles south of the Vernalis Gas Field.

Artnell Shallow Gas Test

Artnell Company has staked location for ROCO-Mauler Unit No. 1 on the northwest quarter of Section 3-10n-1w in Yolo County. The test will go to about 3700 feet and test the Upper Cretaceous Sands present in the Dunnigan Hills Gas Field.

Glenn County Wildcat

H. F. Dangberg, Operator, has staked a location for Dodge Lands No. 1 to be drilled on the northeast quarter of Section 8-19n-1e. The location is five miles east of the Llano Seco Gas Field and will be a 3500-foot test.

East Stockton Gas Test

Occidental Petroleum Corp. is drilling below 5800 feet on Arbini No. 1, a San Joaquin County wildcat gas test located on the northeast quarter of Section 13-1n-7e. The well is located about seven miles east of the town of Stockton.

Two Tests for Cameron

Cameron Oil Company has staked locations for two development wells in the Grimes Gas Field in Colusa County. Grimes Operating Unit Six No. 3, a westerly offset to McLaughlin No. 1, will be drilled in the southeast quarter of Section 6-14n-1e, and Grimes Operating Unit Eight No. 1, an easterly offset to Cameron-Armstrong No. 1, the discovery well of the field, is located on the northwest quarter of Section 8-14n-1e.

Gulf Gas Test

Gulf Oil Corp. of Calif. is drilling below 6600 feet on C. B. Stoddard No. 1, a West Grimes Area outpost test, located on the northeast quarter of Section 9-14n-1w in Colusa County. The location is ½ mile south of the Occidental Petroleum Corp.'s discovery well, Sachreiter No. 1.

Texaco Gas Test

Texaco Inc. is grading roads and rig site for Cowell Foundation No. 2 to be drilled on the southeast quarter of Section 31-5n-5e in San Joaquin County. The well is in the Thornton Gas area and will offset Standard Oil Co.'s Blossom Community No. 1.

COASTAL AREA

West Montalvo Test

Standard Oil Company has staked location for McGrath Five No. 1011-A on Section 36-2n-23w in Ventura County. The well will be drilled to about 13,000 feet.

Padre Canyon Field Well

Socony Mobil Oil Company, Inc., is preparing to drill Padre No. 104, a field development well in the northwest quarter of Section 15-3n-24w.

Offshore Test Abandoned

Richfield Oil Corp. drilled to a total depth of 2250 feet on State 1466 No. 101 and after running logs abandoned the test. The barge was moved to a new location and Well No. 102 is drilling below 1000 feet. Both locations are in projected Section 13-3n-25w offshore from the Rincon Field.

Monterey County Well Completing

Richard R. Thorup, Operator, is moving in pump unit to complete Thomas Doud Estate No. 5. While running the liner, the well blew out of control for several hours flowing wash oil and gas at a 1400 mcf per day rate and died. Located on the southeast quarter of Section 32-20s-8e, the well was drilled to a total depth of 2050 feet and has 7″ casing cemented at 1956 feet.

OTHER AREAS

Alaska

Union Oil Company and The Ohio Oil Company completed Union-Ohio-Kenai Unit No. 44-16 flowing 5300 mcf of gas per day from the perforated interval 5728-5688 feet. Flow was through a ⅜″ bean with a flow pressure of 1550 psi. The completion is 2½ miles southeast of present production at the Kenai Gas Field and is the fifth gas producer. Located in the northeast quarter of Section 19-4n-11w, the well was drilled to a total depth of 6020 feet and cemented 7″ casing at 6006 feet.

Standard Oil Company of Calif. and Richfield Oil Corp. are preparing rig site for Soldotna Creek Unit No. 12-3 located in the northwest quarter of Section 3-7n-9w.

Arizona

Four miles east of the Pinta Dome Helium Field, J. G. Brown, Midland operator, has staked a location for Santa Fe No. 1 on the northeast quarter of Section 34-20n-27e in Apache County. The well is to be a 1200-foot Coconino test and is in an area where a recent gas completion yielded 7 per cent helium.

Colorado

Southern Union Gas Company completed Gross-Hahnewald No. 1 as a Western Colorado new field discovery flowing 1411 mcf of gas per day from the Mesaverde perforations 6180-7394 feet. Shut-in tubing pressure was 1784 psi. Located on the northeast quarter of Section 8-7s-94w in Garfield County, the discovery was drilled to a total depth of 7560 feet and has 5½″ casing cemented at 7499 feet.

Montana

The Superior Oil Company abandoned Blackfeet No. 23-19, its Glacier County wildcat test, at a total depth of 12,705 feet. After an open-hole test of the Madison 12,429-12,483 feet showed a weak blow. Top of the Sawtooth was logged at 12,345 feet and top of the Madison at 12,404 feet. The test was located on the southwest quarter of Section 19-37n-14w in the Chief Mountain area.

Shell Oil Company has staked a location for NPRR No. M-12-15-NP, a Fallon County wildcat test on the northwest quarter of Section 15-9n-58w in the Monarch area. Shell's objective is the Madison at about 7500 feet.

McAlester Fuel Company cemented 9⅝″ casing at 625 feet and is drilling below 5000 feet on R. W. Guess No. A-1 located on the northwest quarter of Section 30-31n-47e in Roosevelt County. The well is about seven miles north of the Tule Creek production and will test the Nisku at 7900 feet.

Signal Drilling and Exploration Co. is drilling below 3500 feet on Willumsen No. 1 located on the northeast quarter of Section 26-32n-58e in Sheridan County. The wildcat is about 1½ miles from production at the Dwyer Field and will test the Madison at approximately 8000 feet.

Texaco Inc. has staked location

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for Twedt No. 3 on the northwest quarter of Section 11-31n-6w in Pondera County. Texaco's location is a southerly outpost to the Southwest Cut Bank Field and will be drilled to about 3200 feet.

Nevada

Shell Oil Company completed Eagle Springs Unit No. 44-18 pumping 414 b/d of 28.0 gravity oil with a cut of 1 per cent. 5½" casing is cemented at 6252 feet and gun perforated with two holes per foot from 6178-6188 feet. The completion is 1060 feet southeast of the discovery well, Eagle Springs Unit No. 1. Located on the northeast quarter of Section 35-9n-57e in Nye County, the completion was drilled to a total depth of 7755 feet and plugged back to 6500 feet.

New Mexico

Humble Oil & Refining Company failed to develop production in the Dakota at its Navajo-L No. 7 and after abandoning the lower portion of the hole, completed the well from the Gallup flowing 265 b/d oil through a ¼" bean. A formation test of the Dakota logged at 6158 feet recovered muddy water. Drilled to a total depth of 6209 feet, 5½" casing was cemented at 5672 feet and gun perforated from 5507-5518 feet. The well is located on the northeast quarter of Section 34-29n-14w at the Cha Cha Pool in San Juan County.

Continental Oil Company's Haynes No. 9-1, located on the southwest quarter of Section 9-24n-5w in Rio Arriba County, was completed as a Triple Zone producer with the Greenhorn being a new discovery. Production from the Greenhorn Zone 6522-6594 feet was 10 b/d of 40 gravity oil; from the Dakota interval 6726-6784 feet gauge was 20 b/d of condensate and 920 mcf of gas, and the Gallup interval 5760-5818 feet, gauge was 40 b/d of 42 gravity oil. The completion is on the south end of the Otero pool and was drilled to a total depth of 6966 feet with 4½" casing cemented at 6958 feet. Top of the Greenhorn was logged at 6523 feet.

Tidewater Oil Company completed New Mexico-Federal Deep Unit No. 1 flowing 11,100 mcf of gas per day through a ¾" bean with flow pressures of 880/1174 psi. Shut-in pressures were 2008/2009 psi. 4½" casing is cemented at 6554 feet and perforated from 6362-6330 feet and 6292-6282 feet. Top of the Dakota was logged at 6256 feet and top of the Morrison at 6552 feet.

North Dakota

Shell Oil Company has staked location for a Billings County deep test, Federal No. 41X-5-1, in the northeast quarter of Section 5-143n-101w. Located in the Central portion of the Williston Basin, nine miles south of the Rough Rider Field, the wildcat will be drilled to approximately 13,000 feet to test the Ordovician.

Utah

Pure Oil Company completed USA-C No. 2 as a new Paradox Salt discovery flowing 105 b/d oil through a 16/64" bean with 675 psi flow pressure. The well is producing from the interval 5934-6088 feet and top of the Salt was logged at 4624 feet. Located on the northwest quarter of Section 3-30s-24e in San Juan County, the well was drilled to 10,706 feet and after tests of the Mississippian and Devonian proved negative, the hole was plugged back and redrilled from 5075-6088 feet.

Richfield Oil Corp. has staked location for Unit No. 1 on the southwest quarter of Section 31-23s-24e in Grand County. The well is on the Onion Creek Unit and will test the Devonian at about 13,000 feet.

The Superior Oil Company has staked location for Unit No. 1 on the southwest quarter of Section 2-34s-9e in Garfield County. The well is located on the recently government-approved 16,119-acre Swamp Mesa Unit and will test the Mississippian at about 8900 feet. British-American Oil Co. and Schermerhorn Oil Co. have an interest in the development.

Bert W. Hancock has announced location for Hay Canyon No. 1, a Grand County wildcat test. The proposed location is in the southwest quarter of Section 32-17s-24e slightly over three miles south of Westwater Field Morrison gas production. The well is to be a 4600-foot Morrison test.

Washington

Humble Oil & Refining Co. is preparing to drill Rosa Meyer No. 1, a Stratigraphic test on the northwest quarter of Section 8-12n-2e in Lewis County. The location falls twenty miles southeast of the town of Chehalis.

Two wildcat tests in the State were abandoned during the month of January, one in Kings County and one in Grays Harbor County. Sunshine Mining Co. and Cascade Gas Co. drilled to a total depth of 2625 feet on France No. 1 before plugging and abandoning. The test was located on the northwest quarter of Section 14-18n-12w near Ocean City. In the Enumclau area in Kings County, A. E. McCrosky abandoned Well No. 1 at a total depth of 3944 feet. The test was located on the northeast quarter of Section 34-21n-6e.

Wyoming

Pure Oil Company, after running open-hole tests on three intervals, plugged and abandoned Unit No. 1 at a total depth of 13,680 feet. Intervals tested were 9231-9266, 12,973-12,990 and 13,326-13,481. Top of the Mesaverde was logged at 9256 feet, top of the Frontier at 12,800 feet and top of the Dakota at 13,290 feet. The test was located on the southwest quarter of Section 21-14n-113w in Uinta County near Butcher Knife Springs.

Continental Oil Company is recovering 120 bbls. of oil per day on a pump test at Lewark No. 6, a southern extension of the Muddy production at the Prairie Creek Field. Three intervals of the Muddy between 5368 feet and 5346 feet are being tested. Located on the southwest quarter of Section 6-53n-68w in Crook County, the test was drilled to a total depth of 5431 feet and cemented 5½" casing on bottom.

Kewanee Oil Company's Federal-A No. 1 failed to flow and is being placed on the pump. A drill stem test of the interval 8229-8268 feet recovered 7200 feet of oil and 200 feet of oil and mud. The well is a northeast outpost of the Minnelusa Pool and is located in the northeast quarter of Section 11-48n-69w. Total depth is 8344 feet, with 5½" casing cemented at 8325 feet. The Minnelusa Sand was logged from 8231-8270 feet.

Shell Oil Company's Howard Ranch Unit discovery, Howard Ranch Unit No. 23-15, on a final test gauged 2000 mcf of gas per day along with 11 b/d condensate and was shut in. Flow was through a 1" bean with a tubing pressure of

250 psi from the Lance perforations 8938-8952 feet. The discovery is located on the southwest quarter of Section 15-39n-93w in Fremont County and was drilled to a total depth of 11,474 feet.

Humble Oil & Refining Co. is preparing to drill Government-Witt No. 1 located on the northeast quarter of Section 24-36n-88w in Natrona County. The well is the first to be drilled on the 48,286-acre Hiland Unit and will test the Lance at approximately 10,000 feet. Other companies having interests in the Hiland Unit are the Shell Oil Co., Husky Oil & Refining Co., Continental Oil Co., Kenwood Oil Co., The California Co., Schermerhorn Oil Co. and the Gulf Oil Corp.

Kewanee Oil Company extended the Raven Creek Field to the southeast with the completion of Pickerel No. 1 pumping 690 b/d from the Minnelusa perforations 8310-8340 feet. The completion is the fifth Minnelusa producer in the field. Located on the southeast quarter of Section 14-48n-69w in Campbell County, the well was drilled to a total depth of 8417 feet and cemented 5½" casing at 8414 feet. The Minnelusa Sand was logged from 8310-8341 feet. Kewanee Oil Co.'s Federal-A No. 1, located in the northeast quarter of Section 11-48n-69w, is being placed on the pump after flowing 160 barrels in four hours from the Minnelusa perforations 8232-8268 feet.

After more than a year of inactivity at the Robinson Ranch Field in Crook County, Pan American Petroleum Company is preparing to drill Robinson-B No. 6 in the northwest quarter of Section 28-50n-67w. A northeastern outpost, the well will be a 6150-foot Minnelusa test.

Southwest Research Institute Suggestion To Help Control Smog

Control of unburned automobile exhaust fumes won't be enough to cut down the smog problem. Designers will have to plug other leaks which permit hydrocarbons to escape into the atmosphere.

This view was given by Southwest Research Institute engineer Kenneth D. Mills in a report prepared for the Motor Vehicle Pollution Control Board of California.

Unburned hydrocarbons which are chemically charged by the sun's rays have long been known to be one of the major causes of the eye-watering, plant-damaging smog which has plagued many of our major cities.

Studies have been made of possible chemical devices, catalytic afterburners, or direct flame afterburners which would oxidize the exhaust gases.

However, Mills says, even the most efficient exhaust control device would only make the auto a little more than half safe. The automobile industry has recognized the importance of crankcase "leaks" and has already voluntarily taken design steps to reduce this smog source.

Noting that the crankcase emits both the unburned gas which escapes between the piston and the rings (blowby) and the oil vapors, it has been suggested that these fumes be recirculated through the combustion system and again attempt to burn them.

Mills says this system will reduce the percentage of hydrocarbons which are vented into the atmosphere, but he points out that it may also result in gummy deposits on valves and pistons.

Instead he suggests that the crankcase fumes be channeled to the afterburners and oxidized there with the exhaust gases.

Mills calls for further research on such a system and also studies of gas which escapes from the carburetor into the atmosphere.

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NEW LITERATURE

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Technical information on foaming agents is the subject of a new brochure just issued by the Dowell Division of the Dow Chemical Company.

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New Handbook on Oil Base Muds

Useful information on Black Magic and related subjects are presented in this 76-page, pocket-size handbook. Included are mixing formulas, treatment, test procedures, description of additives, and instructions for the care and handling of oil base drilling fluids and applications where Black Magic serves best.

It describes Peptomagic and Economagic (oil base muds mixed with crude oil), White Magic (emulsifier), No-Glo Oil (non-fluorescing mixing oil), Formaseal (lost-circulation material) and related products used in the drilling industry.

In addition the handbook contains miscellaneous data such as sizes and capacities of casing, drill pipe, capacities of mud pits and tanks, volume and height filled for various diameters, pump capacities, and other pertinent data useful to anyone involved in mud operations.

Copies will be mailed on request: Oil Base, Inc., 130 Oris St., Compton, California.

LAUGH

A speaker was giving a lecture on forest preservation. "I don't suppose," he said, "that there is a person in this hall who has done a single thing to conserve our timber resources."

Silence ruled for several seconds, then a meek voice from the rear of the hall retorted: "I once shot a woodpecker."

Psychiatrist: "What do you dream about at night?"

Patient: "Baseball."

Psychiatrist: "Don't you dream about anything else?"

Patient: "Nope, just baseball, night after night."

The doctor looked puzzled. "Don't you ever dream about a pretty girl?"

Patient: "What? And miss my turn at bat?"

Grandpa Watkins was sort of absent-minded, so his wife wasn't too surprised when he came in from a walk to the post office and announced that he guessed he'd lost his umbrella. "When did you first miss it?" Grandma wanted to know.

"Just now," replied Grandpa, "it stopped raining and I reached up to put it down and it wasn't there."

"Yes," said the energetic and effervescent young salesman, "I am a mind reader. I can tell exactly what you're thinking."

"In that case," was the retort, "I beg your pardon."

A mother was amused when her daughter started learning Southern folk music in school. She constantly was surprised at the way little Susan twisted around the words.

One day Susan was heard to sing: "I come from Alabama with a band-aid on my knee."

On a questionnaire asking: "What is the principal contribution of the automobile age?" the following answer was given by a college student: "It has practically stopped horse stealing."

THIS

The husband and wife ran frantically to the bus, just to see it pull off about an eighth of a block from them.

"If you hadn't been so long getting ready," he admonished his wife, "we'd have caught it."

"Maybe so," she answered, "but if you hadn't hurried me so, we wouldn't have so long to wait for the next one."

Her mother angrily called little Nancy into the house.

"I saw you running around like wild outside," she said. "Didn't I tell you those other little girls are bad companions?"

"I sure wish you all would make up your minds," Nancy protested. "'Cause that's what their mothers say about me."

OFF!!

Little Joe wanted a dog very badly. But no matter how he pleaded, his mother turned him down.

"They're too messy," she said.

"But," little Joe protested, "if you can stand me, you ought to be able to take anything."

Judy and Jimmy were having a fight in the yard. His mother grabbed Jimmy and told him he was going to get a sound spanking.

"That just isn't fair," he explained. "I admit I hit at Judy, threw a rock, and spit at her—but I missed every time."

Speaking of horse sense, wasn't it the horse that used to be afraid of the automobile at the time that pedestrians were laughing at it?

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